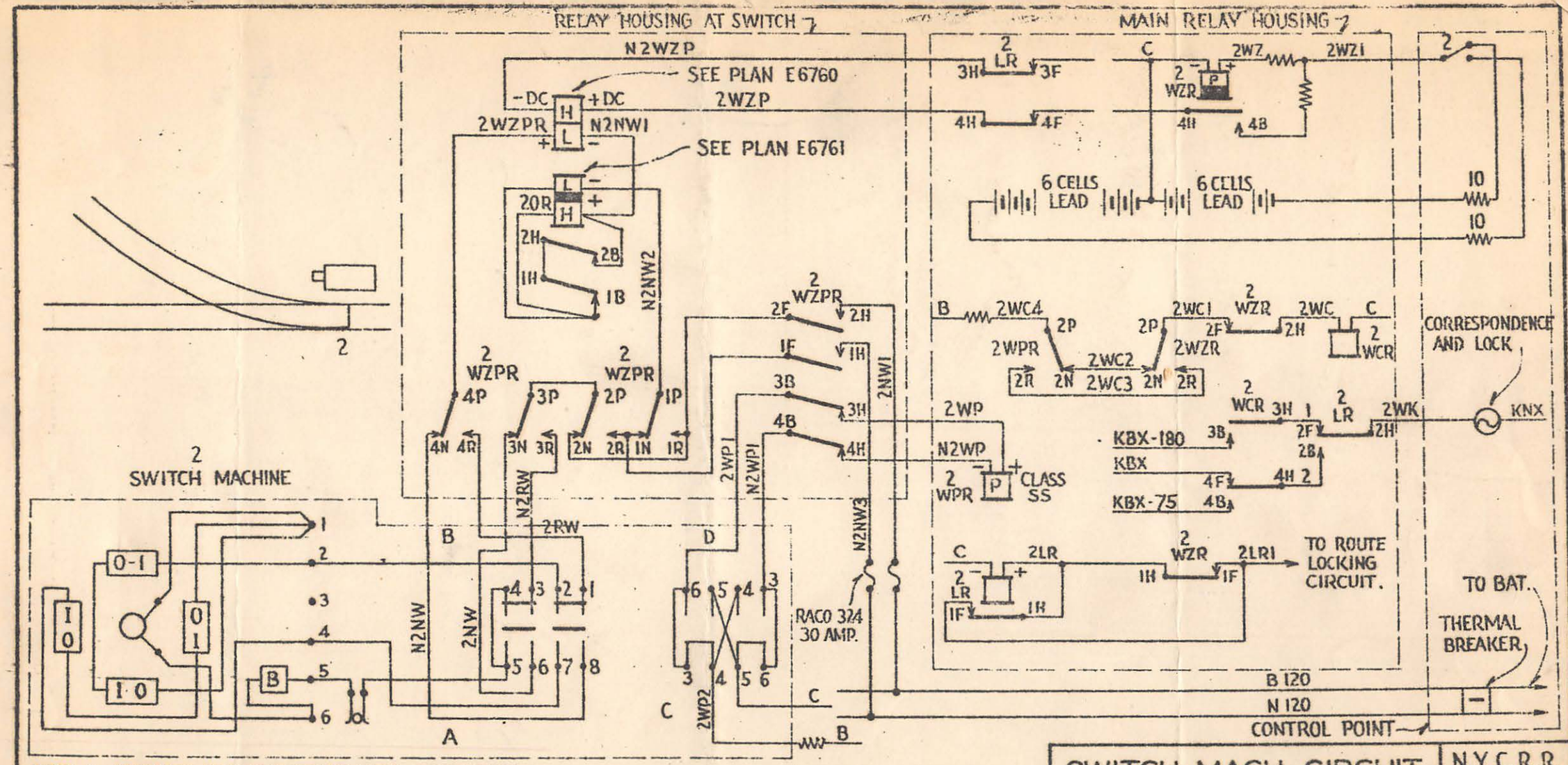
NEW YORK CENTRAL LINES

Signal and Train Control Committee

STANDARDS

1910-1940



NOTE 1 CONTACTS ARE IN POSITION WITH RIGHT HAND POINT CLOSED.

NOTE 2 CONNECTIONS AND "IN" AND "OUT" LEADS OF COILS ARE SHOWN LOOKING AT MOTOR FROM COMMUTATOR END.

LIMITED DISTRIBUTION

SWITCH MACH. CIRCUIT

G.R.S. MODEL 5A HIGH VOLT

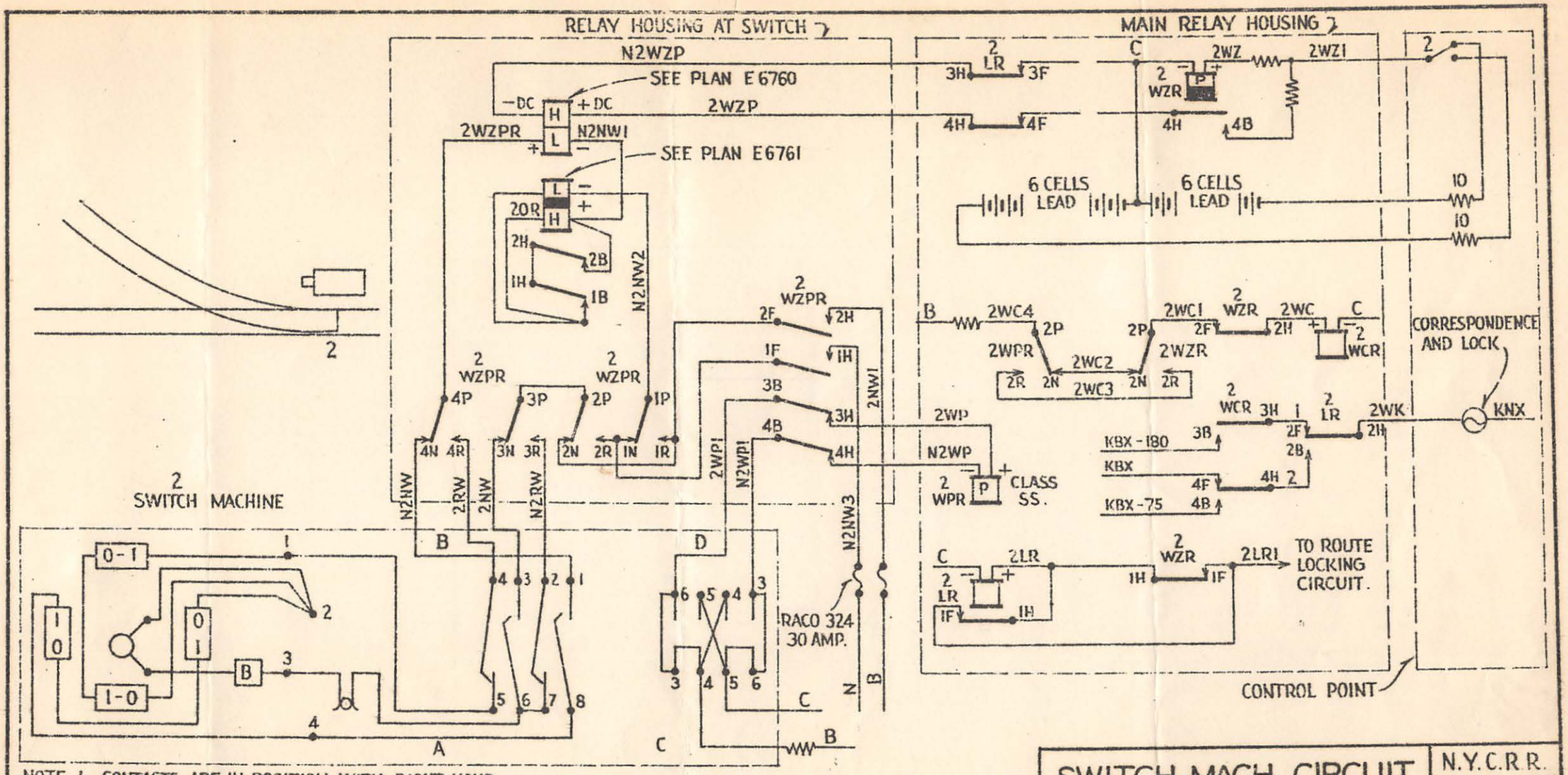
R. B. Elsworth
SIGNAL ENGR.

N.Y.C.R.R.
BUFFALO & EAST

E9810

4-21-42.

4-21-42.
9363A, 9363B
OWN E6760, E6761.



NOTE 1 CONTACTS ARE IN POSITION WITH RIGHT HAND POINT CLOSED.

NOTE 2 CONNECTIONS AND "IN" AND "OUT" LEADS OF COILS ARE SHOWN LOOKING AT MOTOR FROM COMMUTATOR END.

LIMITED DISTRIBUTION

SWITCH MACH. CIRCUIT
G.R.S. MODEL 5A LOW VOLT

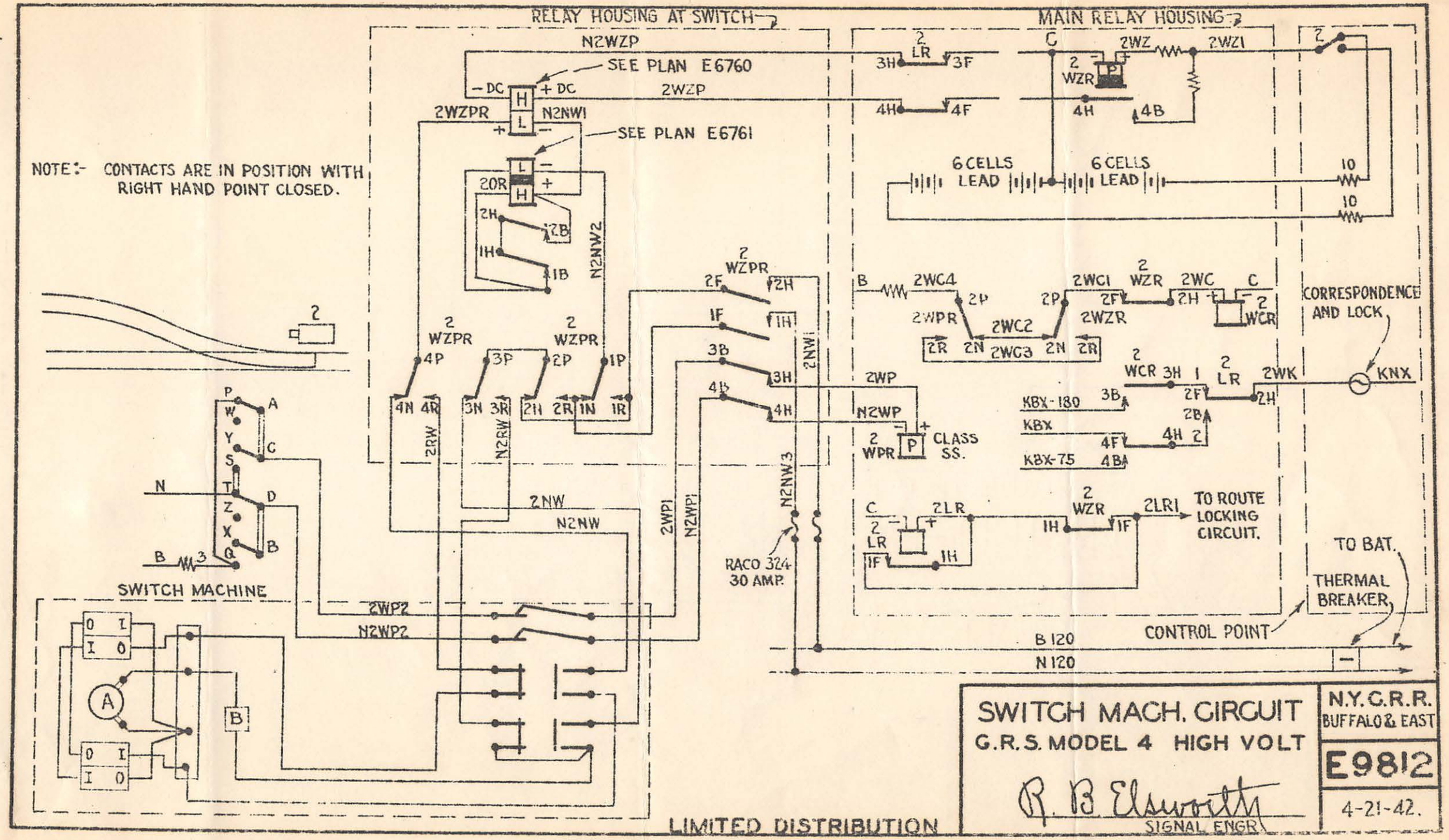
R B Elsworth
SIGNAL ENGR

N.Y.C.R.R.
BUFFALO & EAST

E9811

4-21-42

4-21-42.
9363 A, 9363 B
VH E6760, E6761.



SWITCH MACH. CIRCUIT
G.R.S. MODEL 4 HIGH VOLT

R. B. Elsworth
SIGNAL ENGR.

N.Y.C.R.R.
BUFFALO & EAST

E9812

4-21-42.

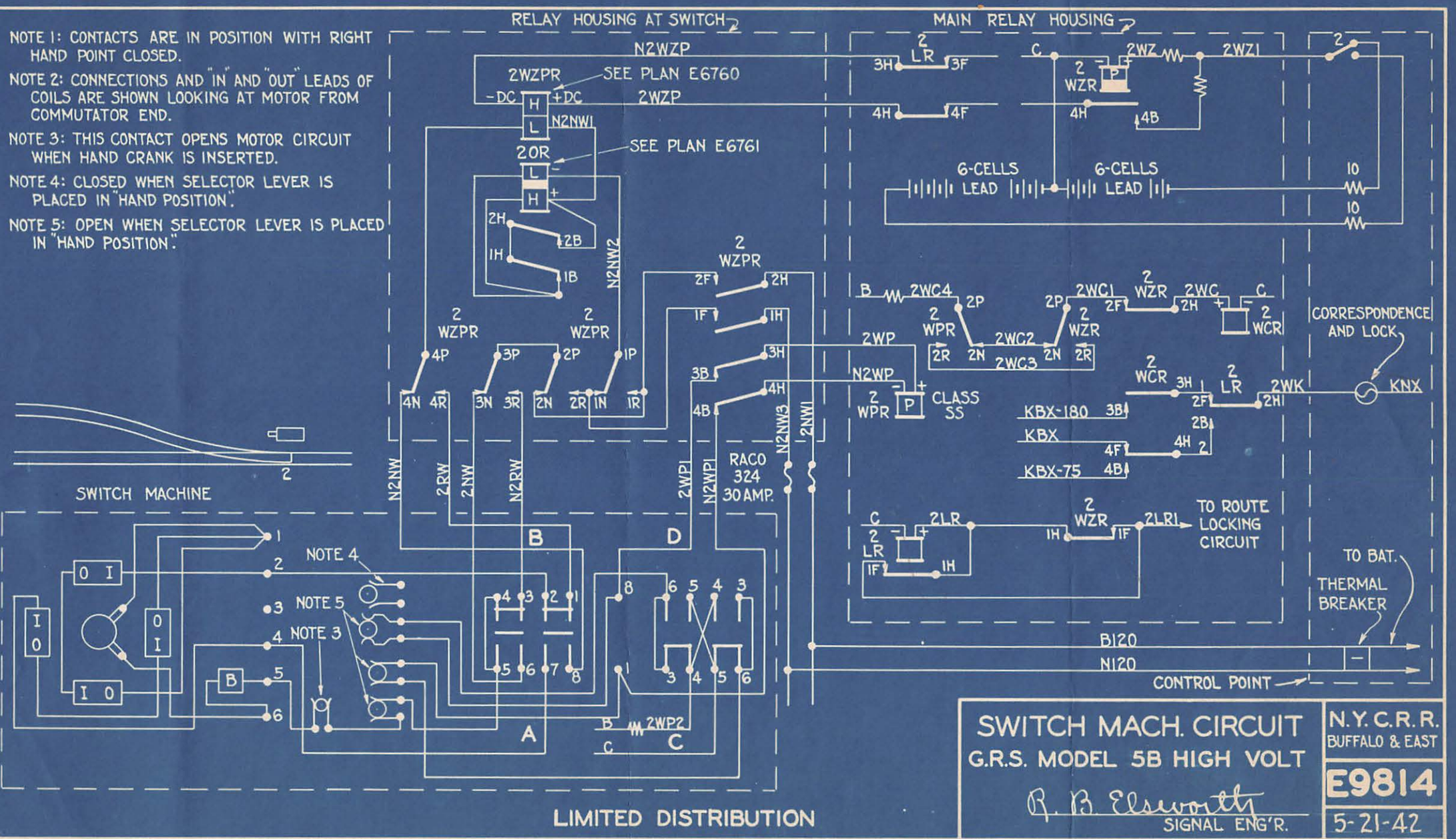
NOTE 1: CONTACTS ARE IN POSITION WITH RIGHT HAND POINT CLOSED.

NOTE 2: CONNECTIONS AND "IN" AND "OUT" LEADS OF COILS ARE SHOWN LOOKING AT MOTOR FROM COMMUTATOR END.

NOTE 3: THIS CONTACT OPENS MOTOR CIRCUIT WHEN HAND CRANK IS INSERTED.

NOTE 4: CLOSED WHEN SELECTOR LEVER IS PLACED IN "HAND POSITION".

NOTE 5: OPEN WHEN SELECTOR LEVER IS PLACED IN "HAND POSITION".



LIMITED DISTRIBUTION

SWITCH MACH. CIRCUIT
G.R.S. MODEL 5B HIGH VOLT

R. B. Elsworth
SIGNAL ENG'R.

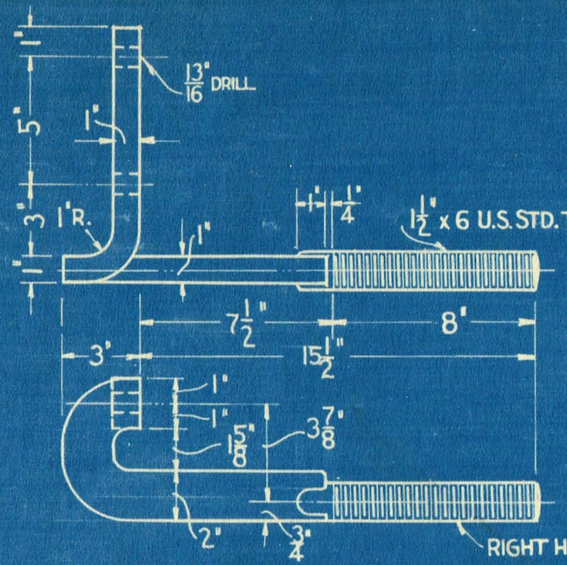
N.Y.C.R.R.
BUFFALO & EAST

E9814

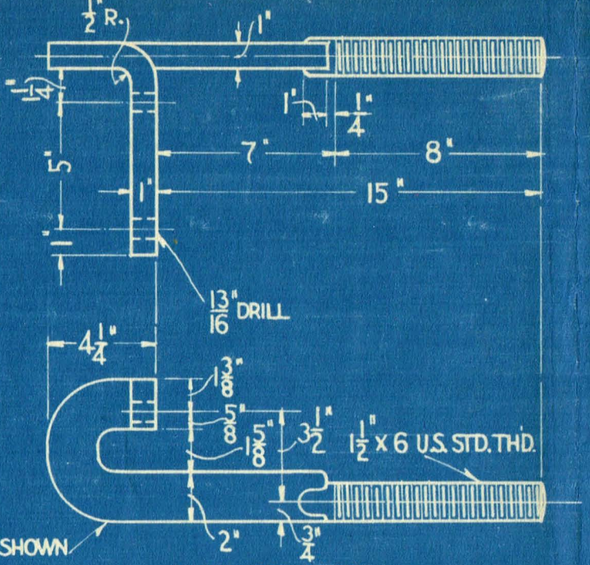
5-21-42

4359

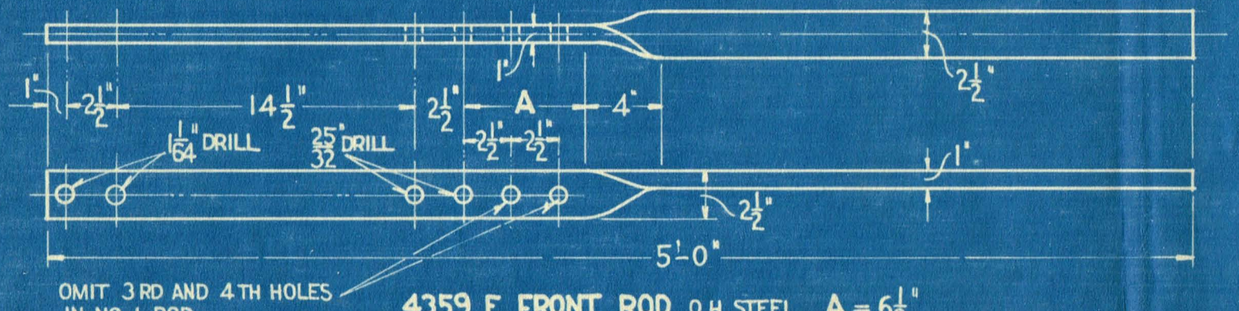
7-11-23



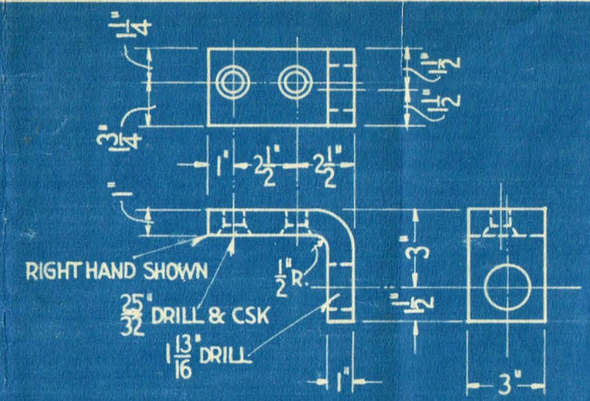
LUG, FRONT ROD, O.H. STEEL.
4359 A RIGHT HAND FOR 100 OR 105 LB. RAIL.
4359 B LEFT HAND " " " "



LUG, NO. 1 ROD, O.H. STEEL.
4359 C RIGHT HAND FOR 100 OR 105 LB. RAIL.
4359 D LEFT HAND " " " "

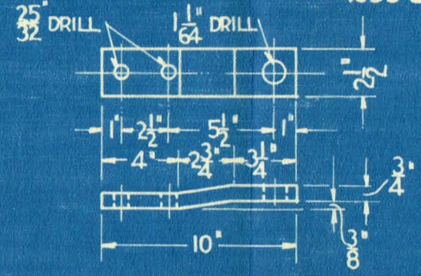


4359 E FRONT ROD, O.H. STEEL. A = 6 1/2"
4359 F NO. 1 ROD " A = 1"



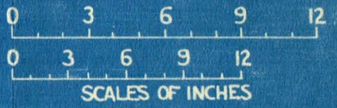
BRACKET. O.H. STEEL.
4359 G RIGHT HAND
4359 H LEFT HAND

4359 J. NUT



4359 L DAB, O.H. STEEL.

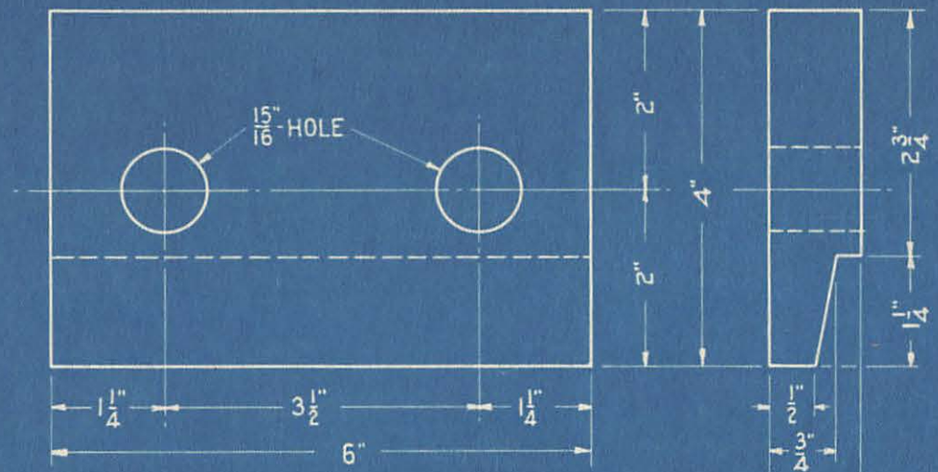
4359 K NUT



N. Y. C. R. R.
SIGNAL DEPARTMENT
RODS AND LUGS
DOUBLE SLIP
ALBANY, JULY 11-1923.

4594

8-23-'24



4594-A, RAIL BRACE, O.H. STEEL

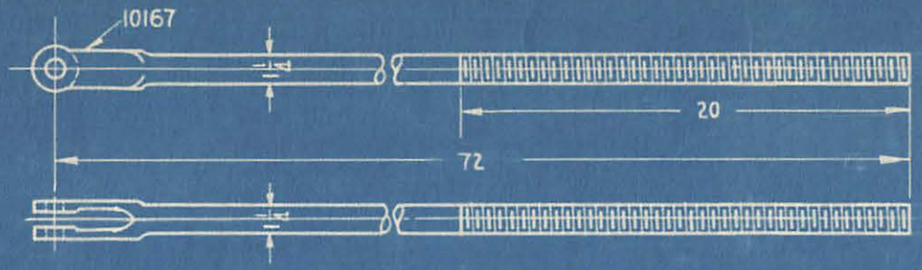
N. Y. C. R. R.

SIGNAL DEPARTMENT

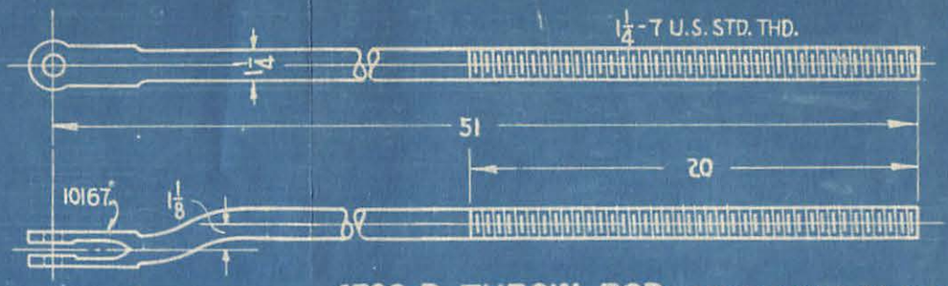
RAIL BRACE
DOUBLE SLIP SWITCH

SCALE:- 6"=1'-0" ALBANY, AUG. 23, 1924.

4703
REVISED
3-10-25



4703-A THROW ROD FOR CRANK
O.H. STEEL.



4703-D THROW ROD FOR SW. POINT - SW. MACHINE
O.H. STEEL.

4703-B THROW ROD FOR FROG SW. MACHINE
O.H. STEEL.

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

4703-C THROW ROD FOR CRANK
O.H. STEEL.

N. Y. C. R. R.
SIGNAL DEPARTMENT

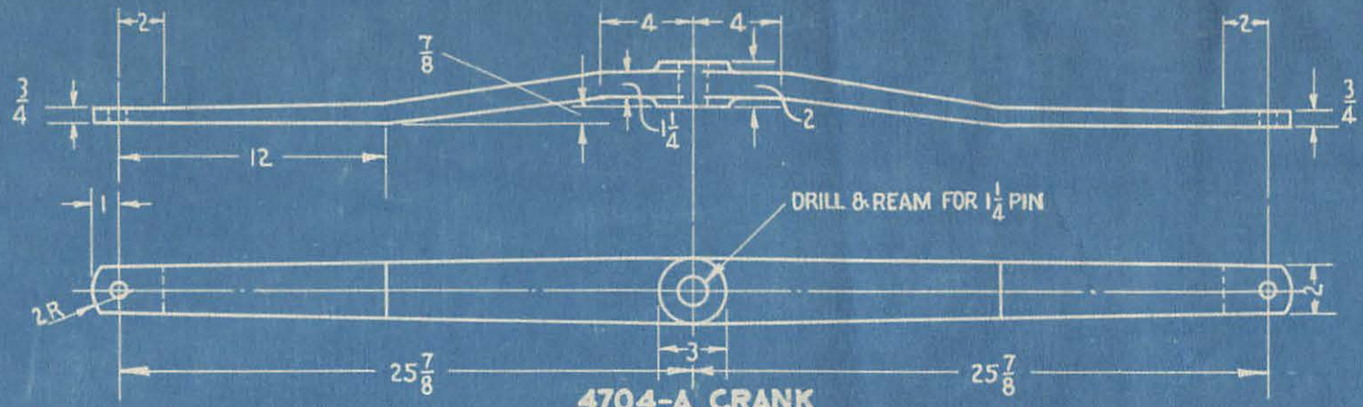
DOUBLE SLIP FITTINGS

THROW RODS

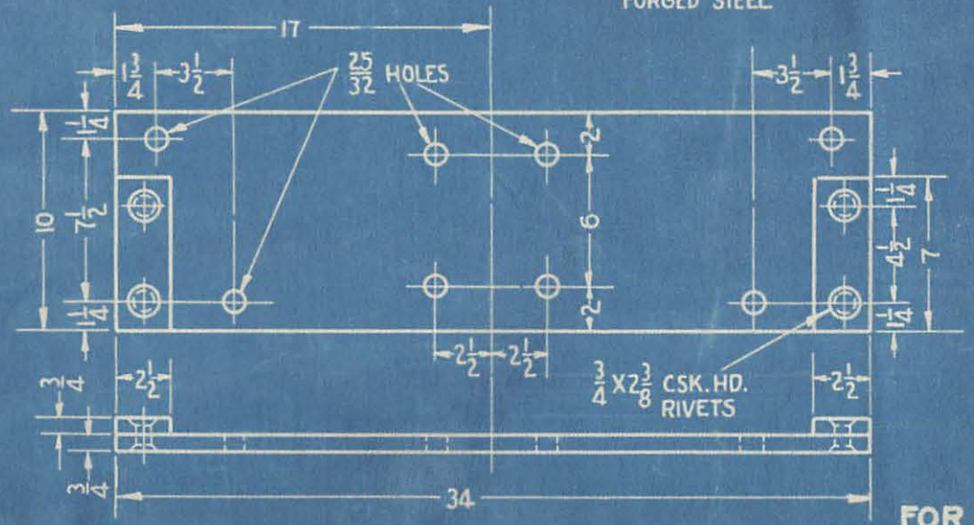
ALBANY FEB. 24-1925

FOR G.R.S. MODEL 4-A SW. MACHINE

470
REVIS
3-10-



4704-A CRANK
FORGED STEEL



4704-B CRANK STAND PLATE
MILD STEEL

FOR G.R.S. MODEL 4-A SW. MACHINE

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

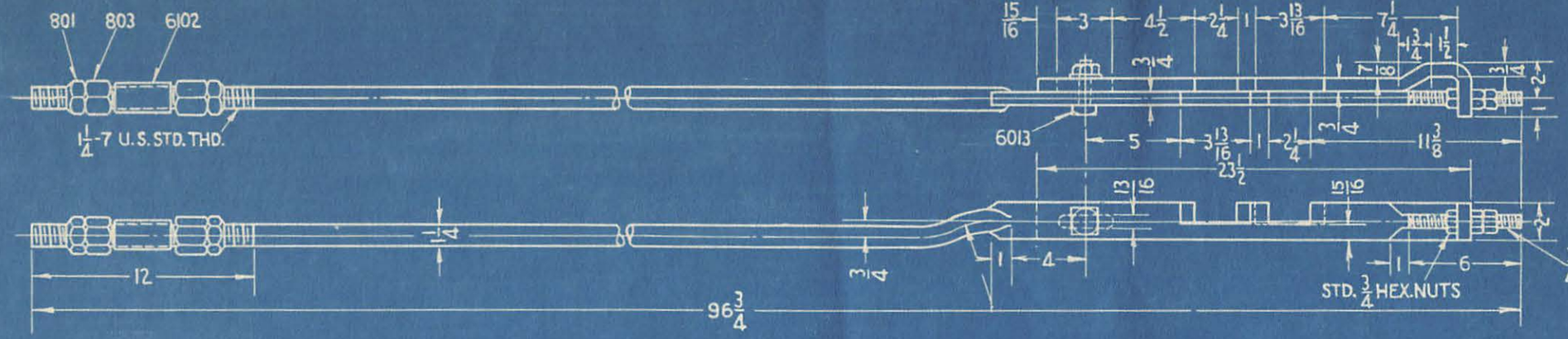
N. Y. C. R. R.
SIGNAL DEPARTMENT

DOUBLE SLIP FITTINGS

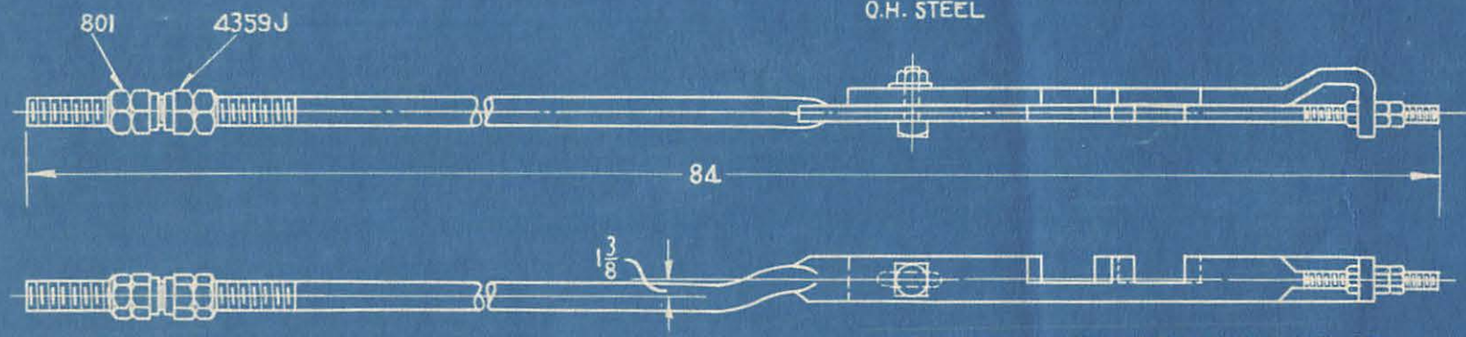
CRANK & PLATE

ALBANY FEB. 24-1925

4705
REVISED
3-10-25



4705-A LOCK ROD FOR FROG
O.H. STEEL



FOR DIMENSIONS NOT SHOWN REFER TO 4705-A

4705-B LOCK ROD FOR SW. POINT
O.H. STEEL

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N.Y.C.R.R.
SIGNAL DEPARTMENT

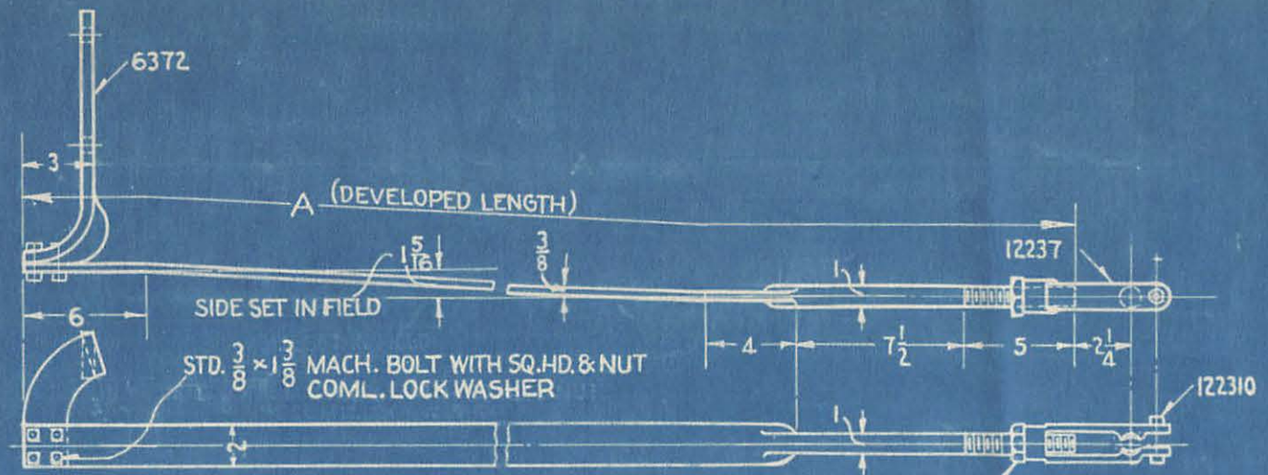
DOUBLE SLIP FITTINGS

LOCK RODS

ALBANY FEB. 24-1925

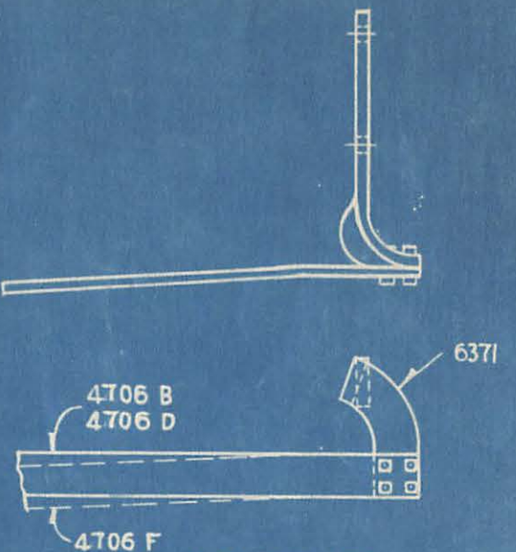
FOR G.R.S. MODEL 4-A SW. MACHINE

4706
REVISED
3-10-25

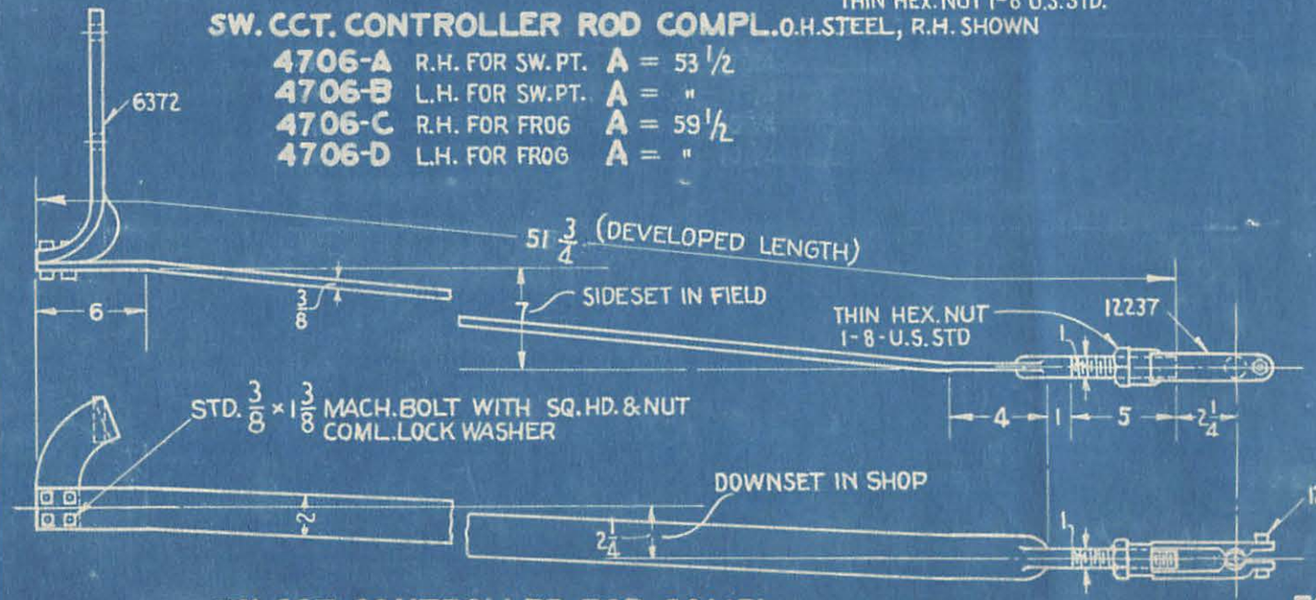


SW. CCT. CONTROLLER ROD COMPL. O.H.STEEL, R.H. SHOWN

4706-A R.H. FOR SW. PT. **A** = 53 1/2
4706-B L.H. FOR SW. PT. **A** = "
4706-C R.H. FOR FROG **A** = 59 1/2
4706-D L.H. FOR FROG **A** = "



L.H. SHOWN



SW. CCT. CONTROLLER ROD COMPL. O.H.STEEL, R.H. SHOWN

4706-E R.H. FOR FROG
4706-F L.H. FOR FROG

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

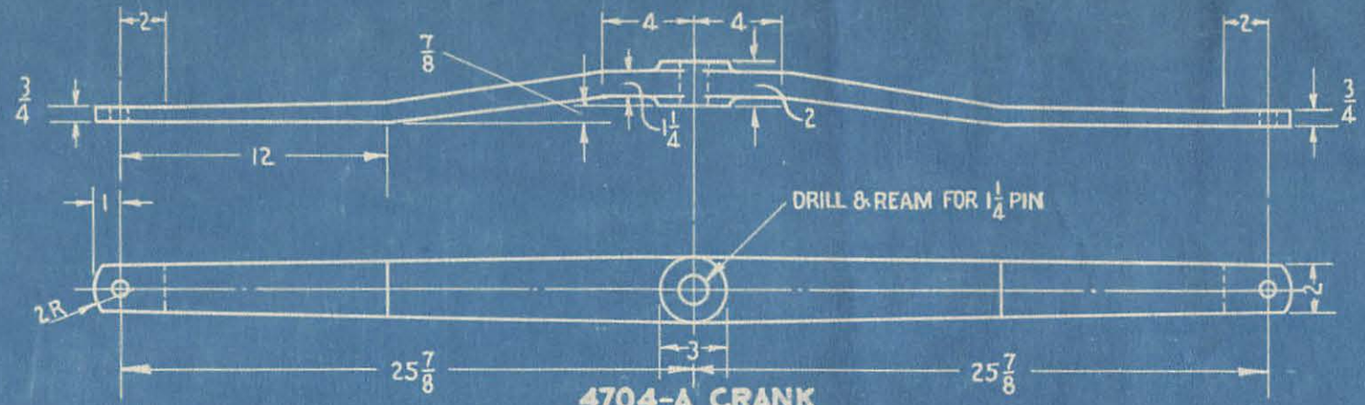
N. Y. C. R. R.
SIGNAL DEPARTMENT

DOUBLE SLIP FITTINGS

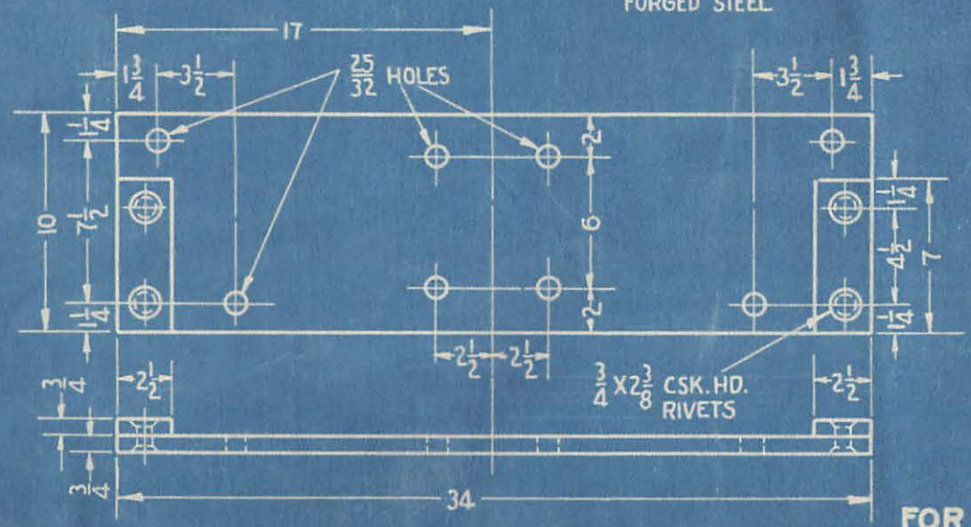
SWITCH CIRCUIT CONTROLLER RODS

ALBANY FEB. 24-1925.

FOR G.R.S. MODEL 4-A
SW. MACHINE



4704-A CRANK
FORGED STEEL



4704-B CRANK STAND PLATE
MILD STEEL

FOR G.R.S. MODEL 4-A SW. MACHINE

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

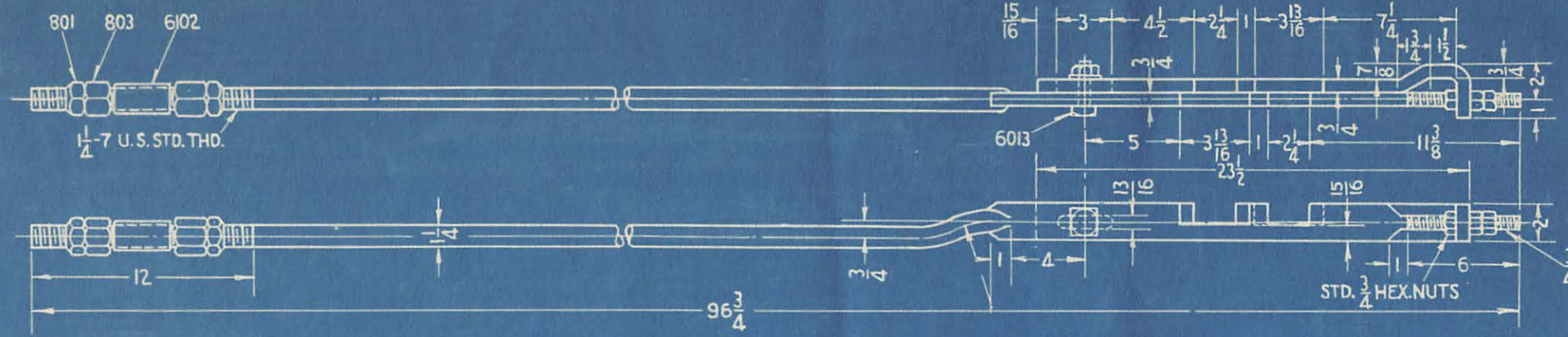
N.Y.C.R.R.
SIGNAL DEPARTMENT

DOUBLE SLIP FITTINGS

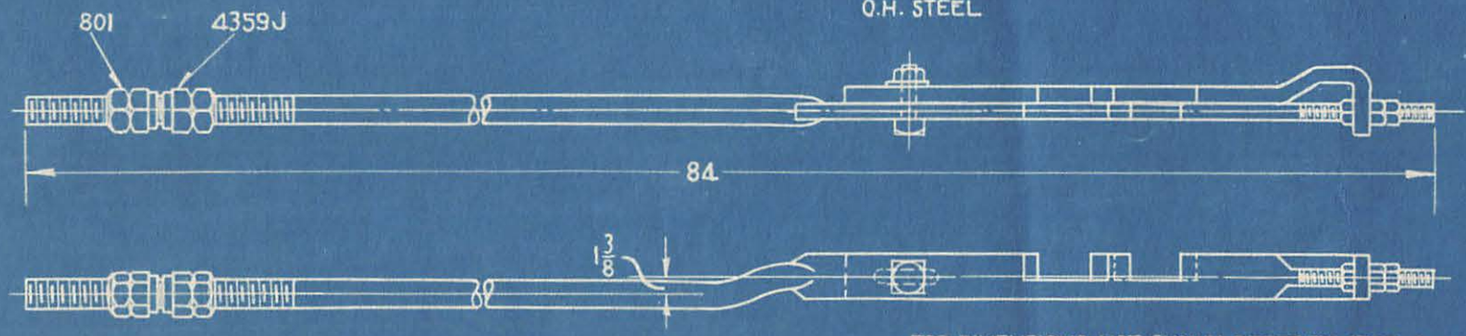
CRANK & PLATE

ALBANY FEB. 24-1925

4705
REVISED
3-10-25



4705-A LOCK ROD FOR FROG
O.H. STEEL



FOR DIMENSIONS NOT SHOWN REFER TO 4705-A

4705-B LOCK ROD FOR SW. POINT
O.H. STEEL

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

FOR G.R.S. MODEL 4-A SW. MACHINE

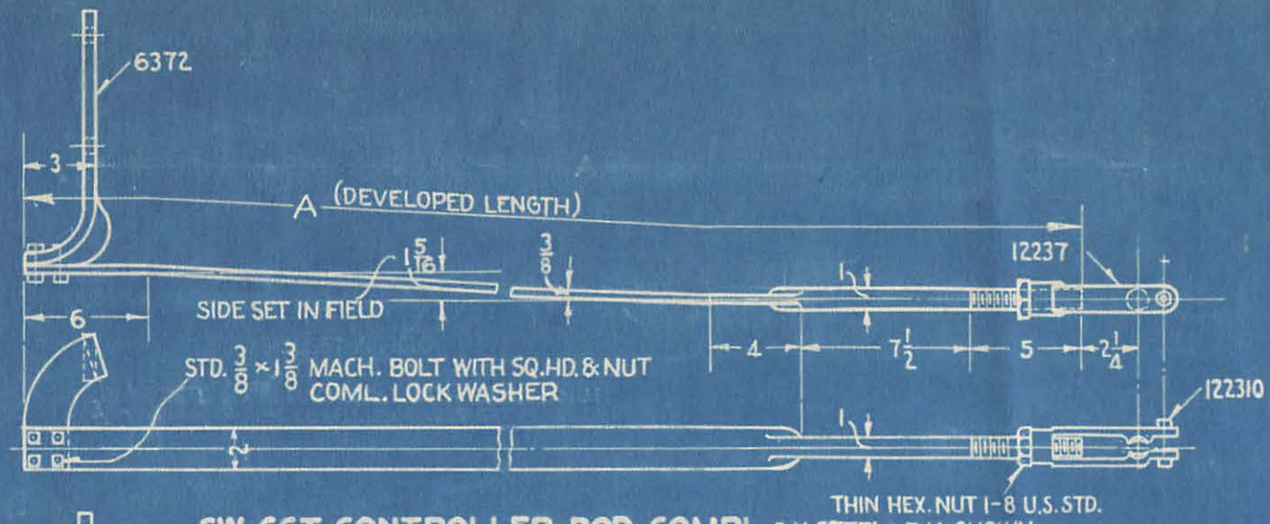
N.Y.C.R.R.
SIGNAL DEPARTMENT

DOUBLE SLIP FITTINGS

LOCK RODS

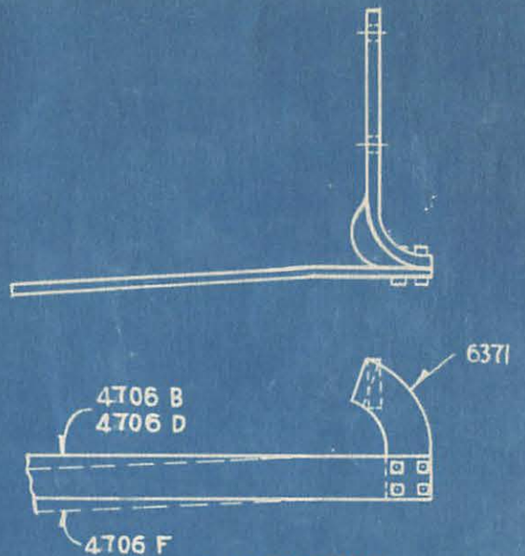
ALBANY FEB. 24-1925

4706
REVISED
3-10-25

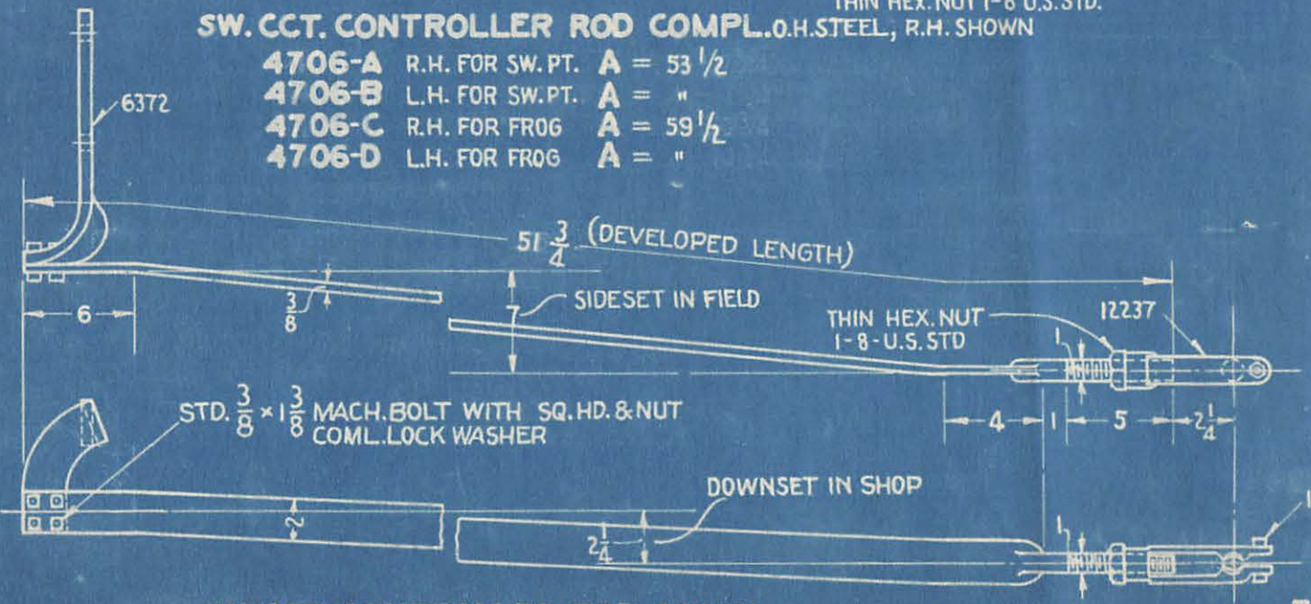


SW. CCT. CONTROLLER ROD COMPL. O.H. STEEL, R.H. SHOWN

4706-A	R.H. FOR SW. PT.	**A** = 53 1/2
4706-B	L.H. FOR SW. PT.	**A** = "
4706-C	R.H. FOR FROG	**A** = 59 1/2
4706-D	L.H. FOR FROG	**A** = "



L.H. SHOWN



SW. CCT. CONTROLLER ROD COMPL. O.H. STEEL, R.H. SHOWN

4706-E	R.H. FOR FROG
4706-F	L.H. FOR FROG

0 3 6 9 12 24

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.

SIGNAL DEPARTMENT

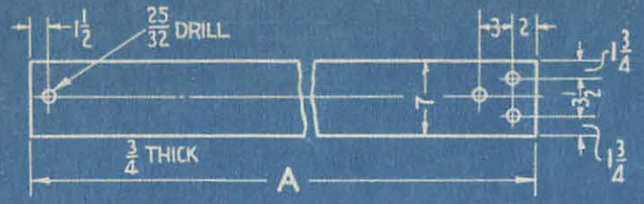
DOUBLE SLIP FITTINGS

SWITCH CIRCUIT CONTROLLER RODS

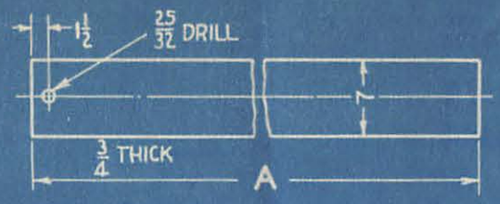
ALBANY FEB. 24-1925.

FOR G.R.S. MODEL 4-A SW. MACHINE

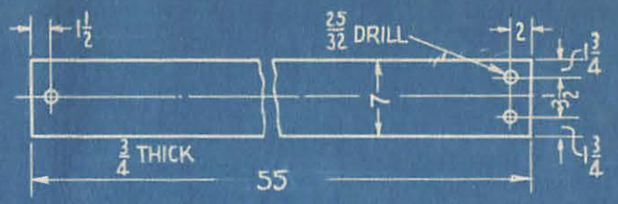
4707
REVISED
3-10-25



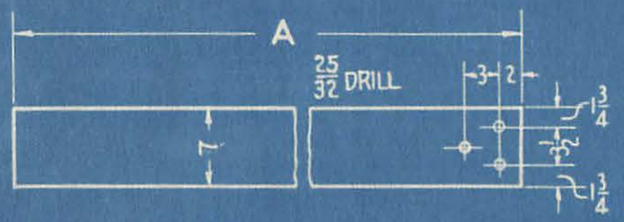
4707-A — A = 55
4707-B — A = 60



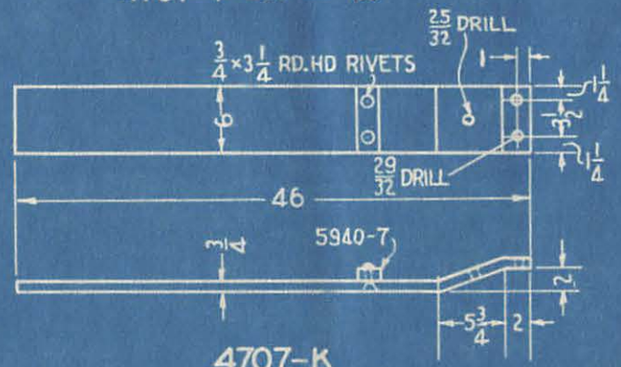
4707-C — A = 55
4707-D — A = 60
4707-E — A = 62
4707-F — A = 63



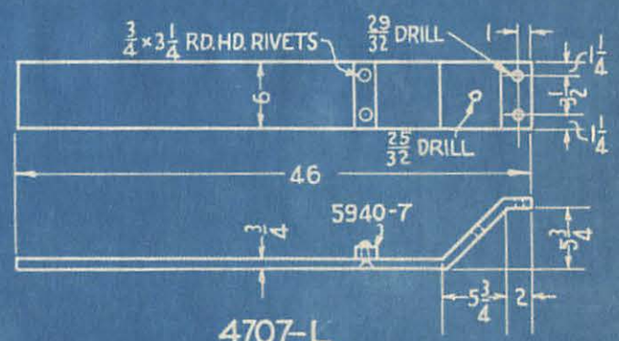
4707-G



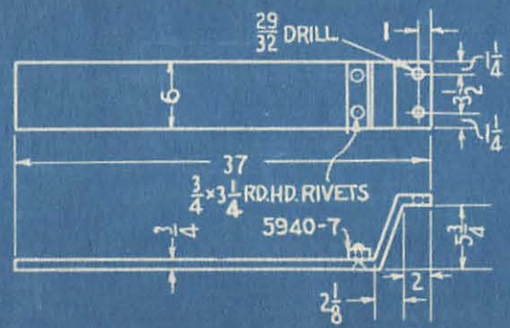
4707-H — A = 33
4707-J — A = 55



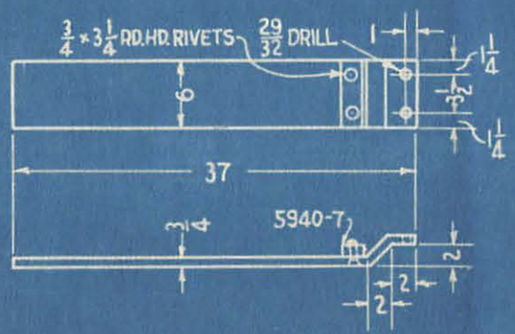
4707-K



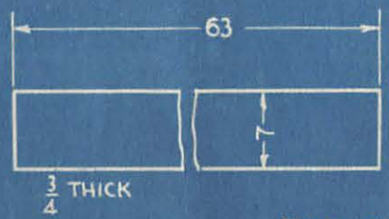
4707-L



4707-M



4707-N



4707-O

0 3 6 9 12 24

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N.Y.C.R.R.

SIGNAL DEPARTMENT

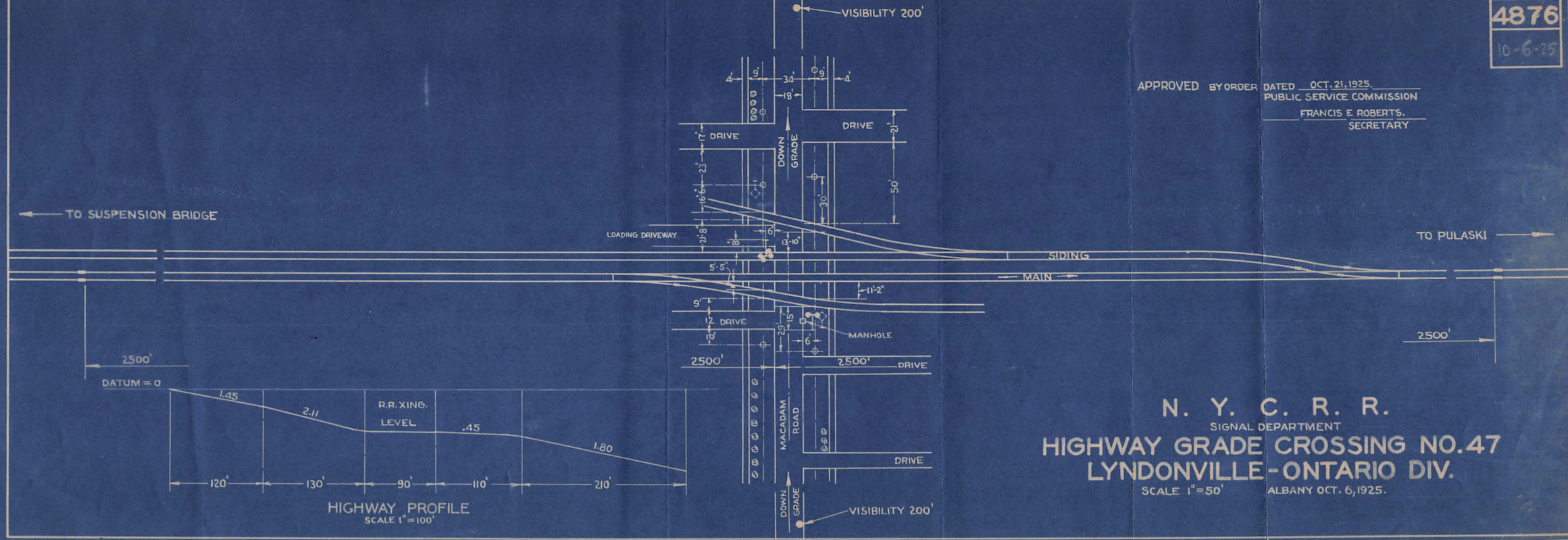
TIE PLATES

ALBANY FEB. 20-1925

FOR G.R.S. MODEL 4-A SW. MACHINE

4876
10-6-25

APPROVED BY ORDER DATED OCT. 21, 1925.
PUBLIC SERVICE COMMISSION
FRANCIS E ROBERTS.
SECRETARY



HIGHWAY PROFILE
SCALE 1" = 100'

N. Y. C. R. R.

SIGNAL DEPARTMENT

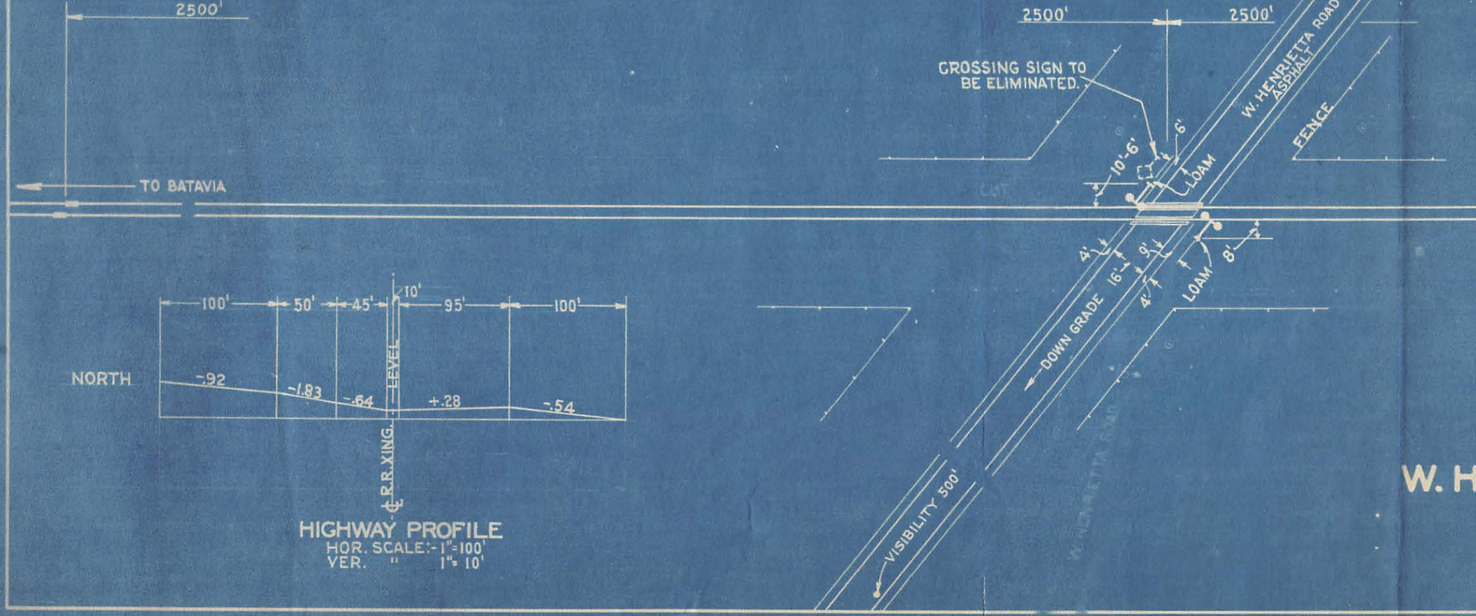
HIGHWAY GRADE CROSSING NO. 47
LYNDONVILLE - ONTARIO DIV.

SCALE 1" = 50' ALBANY OCT. 6, 1925.

4898
11-13-25

APPROVED BY ORDER DATED NOV. 25, 1925.
PUBLIC SERVICE COMMISSION
FRANCIS E ROBERTS
SECRETARY

HIGHWAY PROFILE
HOR. SCALE:- 1"=100'
VER. " 1"= 10'

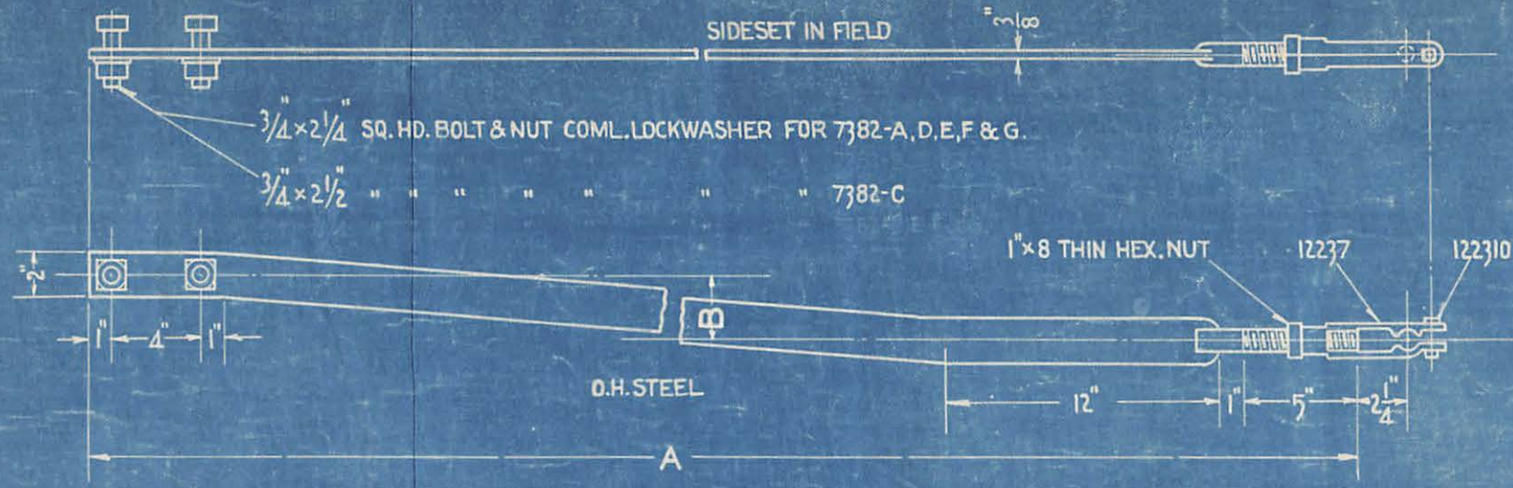


N. Y. C. R. R.
SIGNAL DEPARTMENT

W. HENRIETTA HIGHWAY GRADE CROSSING
WEST RUSH, ROCHESTER DIV.

SCALE 1"= 50' ALBANY, NOV. 13, 1925

7382
REVISED
11-30-28



7382	A	SW. CCT. CONTROLLER ROD COMPL.	M.P. FROG	CRANK SIDE	A = 63"	B = 3 7/8"	G.R.S. MOD. 4A.
7382	C	" " " " "	DOUBLE SLIP		A = 38"	B = 3 3/8"	" " "
7382	D	" " " " "	SINGLE SLIP & SINGLE SW.		A = 39"	B = 3"	" " "
7382	E	" " " " "	SINGLE SWITCH		A = 56 3/4"	B = 1"	5A & MECH.
7382	F	" " " " "	7634, 7636, 7638,		A = 64 3/4"	B = 1"	
7382	G	" " " " "	7632		A = 72 3/4"	B = 1"	

0 3 6 9 12
SCALE OF INCHES

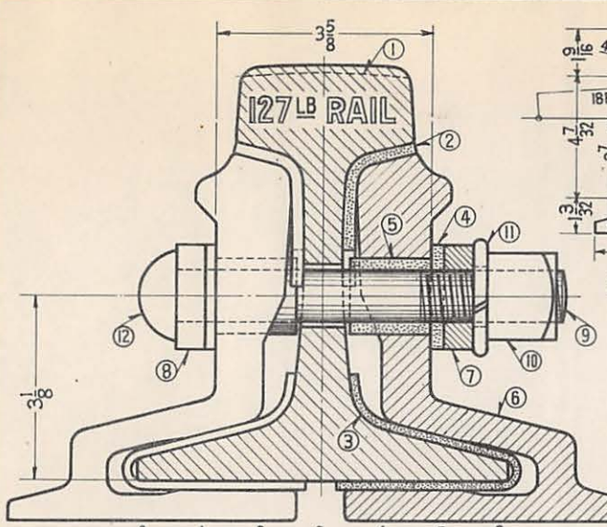
N. Y. C. R. R.
SIGNAL DEPARTMENT

SW. CCT. CONTROLLER RODS

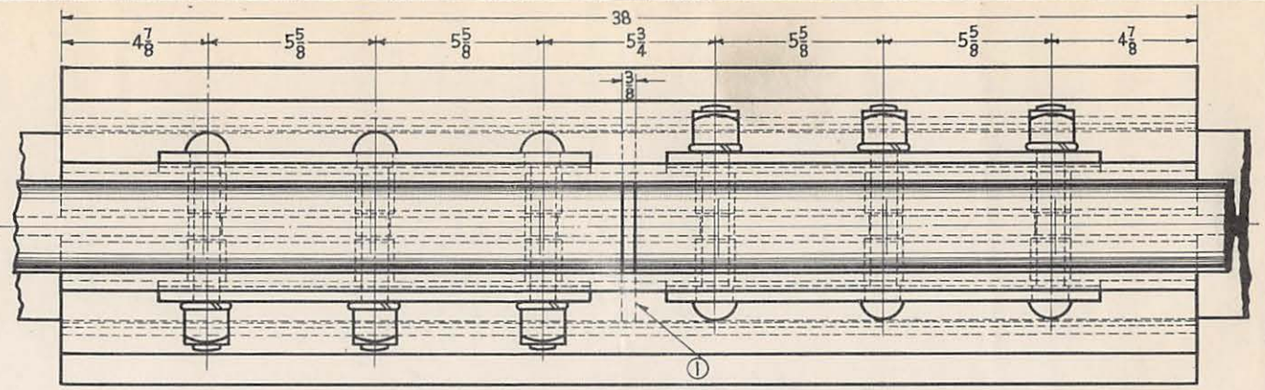
127 LB. RAIL

ALBANY MAR. 17, 1928.

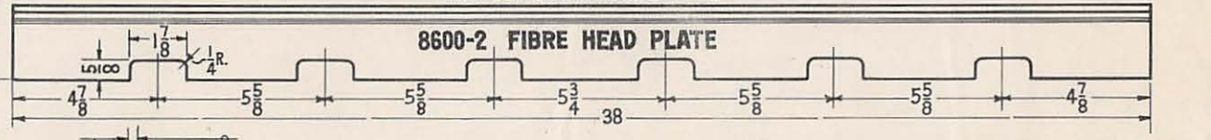
W. H. Elliott. 4/5/28.
SIGNAL ENGR.



8600-1 FIBRE END POST

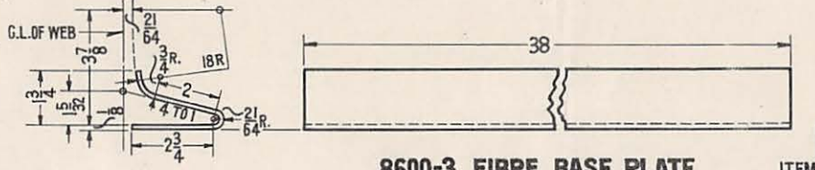


8600-13 FULL INSULATED RAIL JOINT COMPL.
127 LB. CONTINUOUS TYPE



8600-2 FIBRE HEAD PLATE

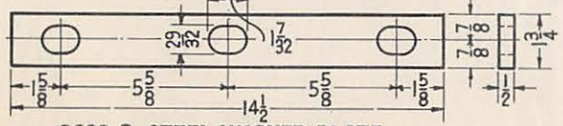
8600-6 JOINT BAR



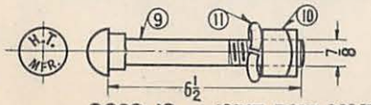
8600-3 FIBRE BASE PLATE

SCALES AND ALL DIMENSIONS GIVEN IN INCHES

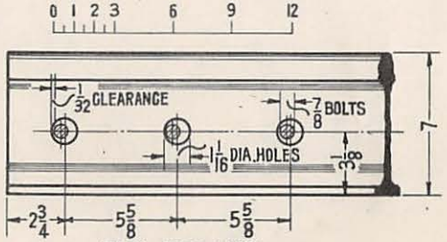
8600-7 STEEL WASHER PLATE



8600-8 STEEL WASHER PLATE

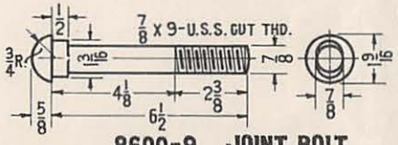


8600-12 JOINT BOLT COMPL.—HEAT TREATED



RAIL DRILLING

8600-4 FIBRE WASHER PLATE



8600-9 JOINT BOLT
HEAT TREATED

8600-10 JOINT BOLT NUT

8600-11 IMPROVED HI-POWER SPG. WASHER

8600-5 FIBRE BUSHING

NOTE: WHEN ORDERING PARTS GIVE REFERENCE NUMBER AND NAME AS SHOWN IN LARGE TYPE OR IN THE TABLE. { SEE PLAN 8610 FOR ONE-END INSULATED }

TABLE OF PARTS

ITEM	REF. NO.	RQD.	NAME
①	8600-1	1	FIBRE END POST
②	8600-2	2	" HEAD PLATE
③	8600-3	2	" BASE "
④	8600-4	4	" WASHER PLATE
⑤	8600-5	12	" BUSHING
⑥	8600-6	2	JOINT BAR
⑦	8600-7	2	STEEL WASHER PLATE (ROUND HOLES)
⑧	8600-8	2	" " " (OVAL HOLES)
⑨	8600-9	6	JOINT BOLT ONLY
⑩	8600-10	6	" " NUT
⑪	8600-11	6	" " SPG. WHR.
⑫	8600-12	6	" " COMPL.
⑬	8600-13		ASSEMBLY - INS'D RAIL JOINT COMPL.

BOLT COMPL. 8600-12

SIGNAL COMMITTEE — NEW YORK CENTRAL LINES

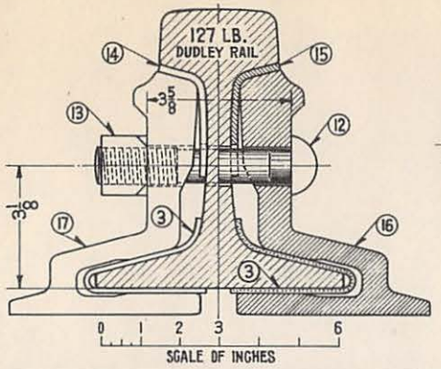
INSULATED RAIL JOINT
CONTINUOUS TYPE
127 LB. RAIL — DUDLEY SECTION

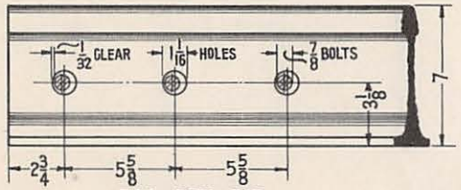
N.Y.C. R.R.(E). N.Y.C. R.R.(W). N.Y.C. R.R.(OCL). B.&A.R.R. M.C.R.R. C.C.C.&St.L.RY. P.&L.E.R.R. RUTL. R.R.

8600
AUG. 19' 1927
JULY 9' 1929

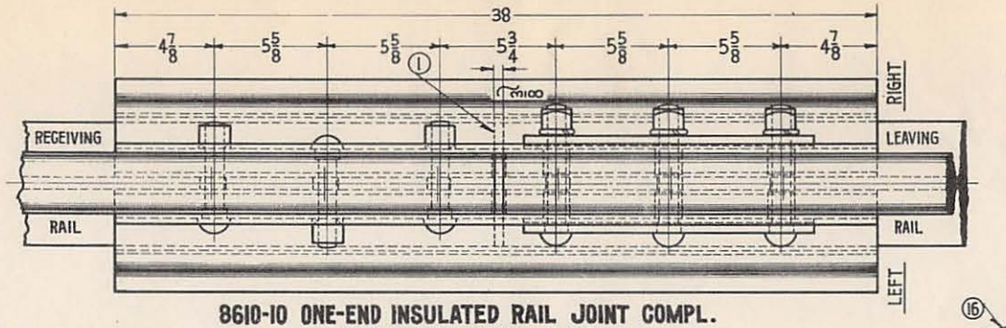
APPROVED BY REPRESENTATIVES OF LINES SHOWN.

NON-INSULATED END





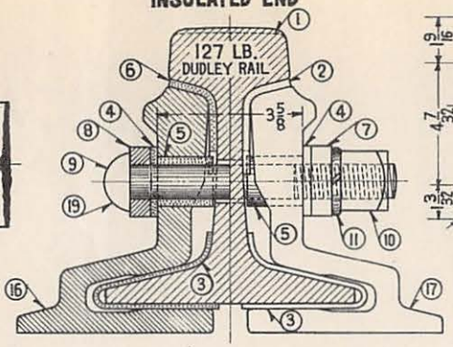
RAIL DRILLING

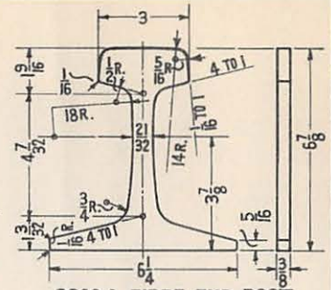


8610-10 ONE-END INSULATED RAIL JOINT COMPL.
127 LB. CONTINUOUS TYPE

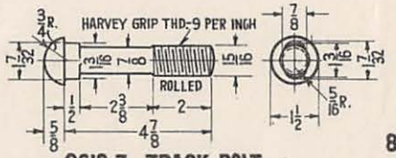
8610-1 JOINT BAR—LEFT- WITH HOLES 'A' SHOWN IN FULL LINES.
8610-2 JOINT BAR—RIGHT- WITH HOLES 'A' TRANSPOSED AS SHOWN IN DOTTED LINES.

INSULATED END

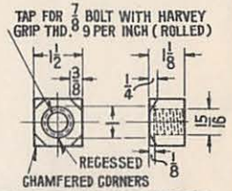




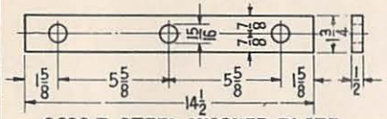
8600-1 FIBRE END POST



8610-7 TRACK BOLT
HEAT TREATED



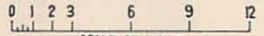
8610-8 TRACK BOLT NUT

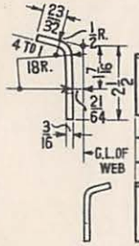


8600-7 STEEL WASHER PLATE

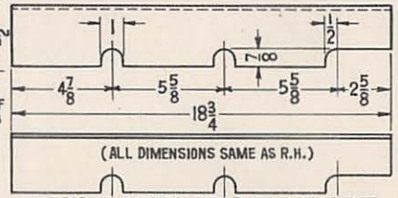
8600-8 STEEL WASHER PLATE

8600-4 FIBRE WASHER PLATE



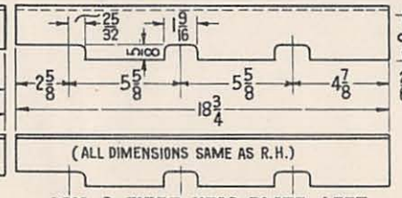


8610-3 STEEL HEAD PLATE-RIGHT

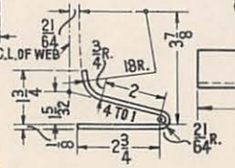


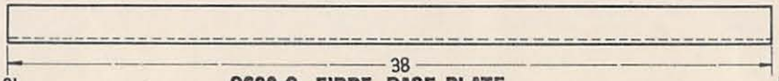
8610-5 STEEL HEAD PLATE-LEFT

8610-4 FIBRE HEAD PLATE-RIGHT

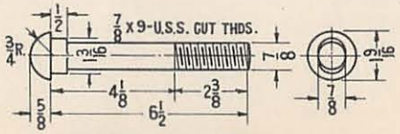


8610-6 FIBRE HEAD PLATE-LEFT

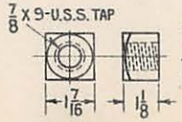




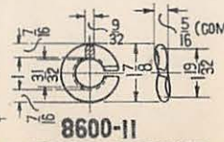
8600-3 FIBRE BASE PLATE



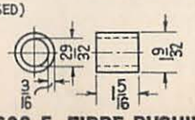
8600-9 JOINT BOLT
HEAT TREATED



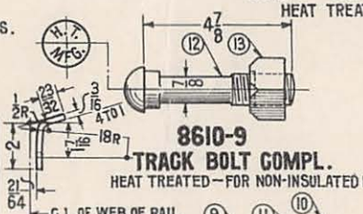
8600-10
JOINT BOLT NUT



8600-11
IMPROVED HI-POWER
SPG. WASHER

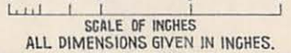


8600-5 FIBRE BUSHING



8610-9
TRACK BOLT COMPL.
HEAT TREATED—FOR NON-INSULATED END

8600-12 JOINT BOLT COMPL.
HEAT TREATED — FOR INSULATED END



ALL DIMENSIONS GIVEN IN INCHES.

NOTE: WHEN ORDERING PARTS GIVE REFERENCE NUMBER AND NAME SHOWN IN LARGE TYPE OR IN THE TABLE. (SEE PLAN 8600 FOR FULL INSULATED)

ITEM	TABLE OF PARTS			
	REF. NO.	RQ'D.	NAME	
①	8600-1	1	FIBRE END POST	
②	8610-4	1	" HEAD PLATE—RIGHT	
③	8600-3	2	" BASE "	
④	8600-4	2	" WASHER PLATE	
⑤	8600-5	6	" BUSHING	
⑥	8610-6	1	" HEAD PLATE—LEFT	
⑦	8600-7	1	STEEL WASHER PLATE (RD. HOLES)	
⑧	8600-8	1	" " " (OVAL HOLES)	
⑨	8600-9	3	JOINT BOLT ONLY	BOLT COMP. 8600-12
⑩	8600-10	3	" " NUT ONLY	
⑪	8600-11	3	" " SPG. WHR.	
⑫	8610-7	3	TRACK " ONLY	BOLT COMP. 8610-9
⑬	8610-8	3	" " NUT ONLY	
⑭	8610-3	1	STEEL HEAD PLATE—RIGHT	
⑮	8610-5	1	" " " —LEFT	
⑯	8610-1	1	JOINT BAR—LEFT	
⑰	8610-2	1	" " —RIGHT	
⑱	8610-10		ASSEMBLY-INSULATED JOINT COMPL.	
⑲	8600-12	3	JOINT BOLT COMPL.—INSULATED END	

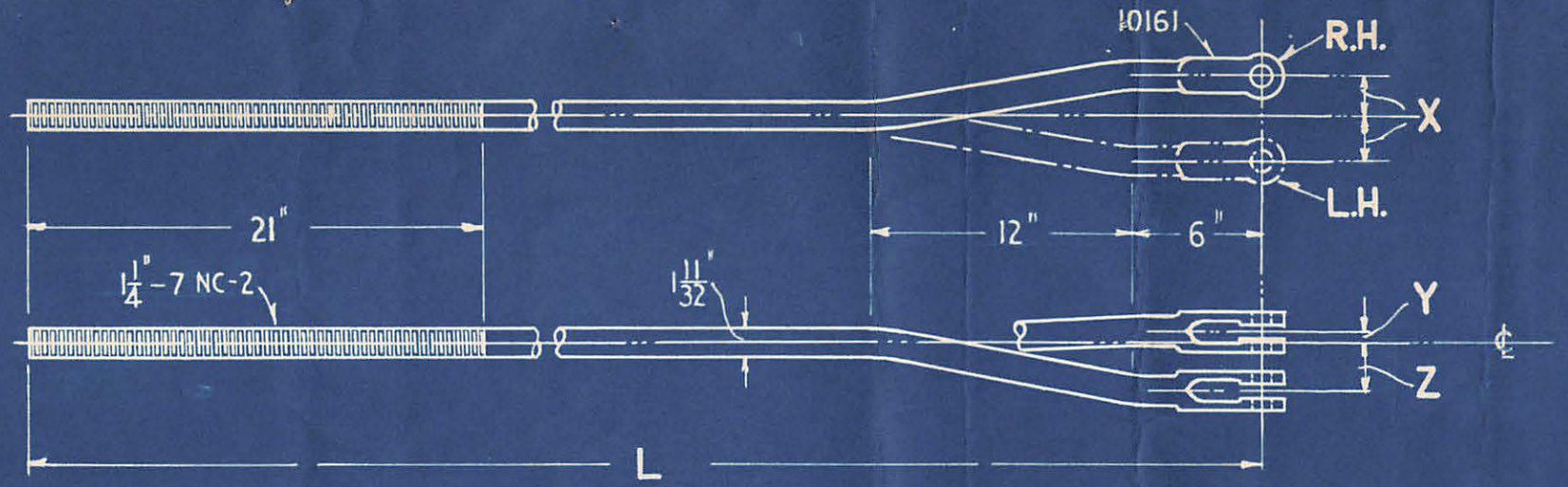
SIGNAL NEW YORK CENTRAL LINES COMMITTEE

ONE-END INSULATED RAIL JOINT
CONTINUOUS TYPE
127 LB. RAIL— DUDLEY SECTION

N.Y.C. R.R.(E).
N.Y.C. R.R.(W).
N.Y.C. R.R.(OGL).
B.&A.R.R.
M.C.R.R.
C.C.C.&ST.L.RY.
P.&L.E.R.R.
RUTL.R.R.

8610
AUG. 19' 1927
JULY 9' 1929

APPROVED BY REPRESENTATIVES OF LINES SHOWN



SAE-1020 STEEL FORGED

NOTE: PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH SIGNAL AND TRAIN CONTROL COMMITTEE INSTRUCTION 350.

THROW ROD		GAUGE TO SW. MACH.	WEIGHT OF RAIL	TYPE OF NO. 1 ROD	L	X	Y	Z	ZONE
RIGHT HAND REF. NO.	LEFT HAND REF. NO.								
9016AR	9016AL	36"	105-112-127	HORIZONTAL	4'-9"	2"		2⅛"	ELECTRIC
" BR	" BL	"	" " "	VERTICAL	"	1½"		1½"	"
" CR		"	112-127	HORIZONTAL	"	2"	0	0	EXTERIOR
" DR	" DL	"	" "	VERTICAL	"	1½"	½"		"
" ER		50"	105-112-127	HORIZONTAL	5'-11"	2"	0	0	ELECTRIC & EXTERIOR
" FR	" FL	"	" " "	VERTICAL	"	1½"	½"		" "

THROW RODS
G.R.S. 4A SWITCH MACHINE
SWITCH, SINGLE SLIP, PT. DERAIL

SIGNAL ENGR.

N.Y.C.R.R.
BUFFALO & EAST

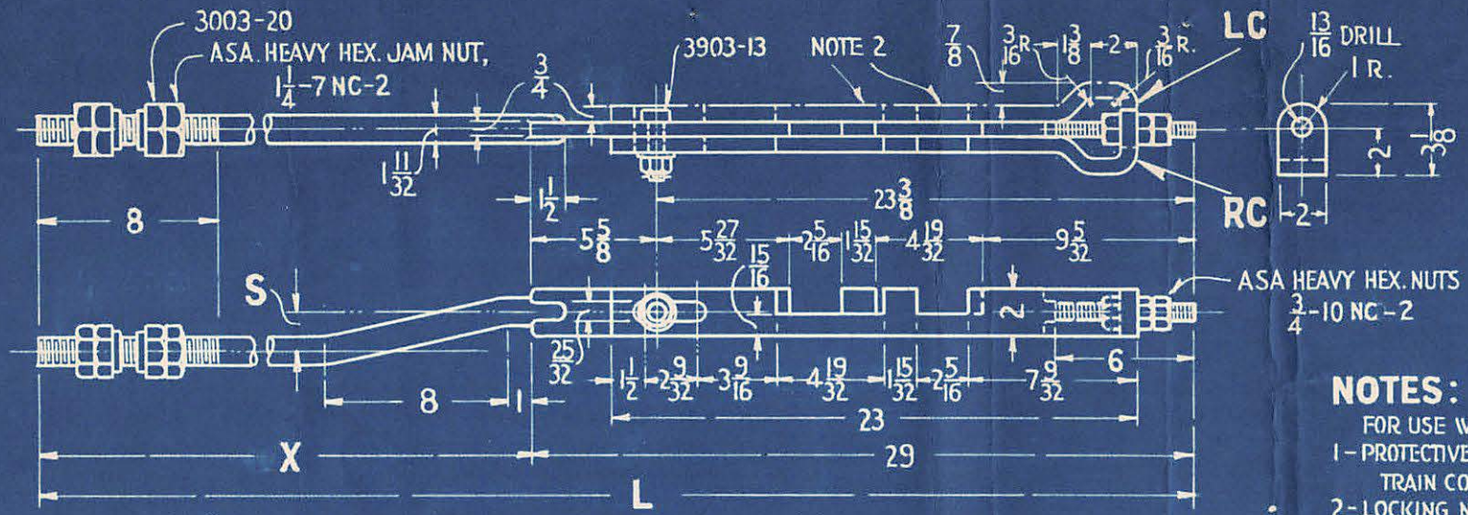
9016

7-15-40

We Remember CNE 1.2.3
1940

7-15-40
FORMERLY 9006 - 9100

1-31-41 - DIM. AT HEEL OF FLAT SECTION CORRECTED TO $5\frac{5}{8}$" AND EXTENDED TO BOLT. - DIM. FROM TIP OF ROD TO BOLT CORRECTED TO $23\frac{3}{8}$ WAS $23\frac{1}{2}$, DIM. BET. ROUND & FLAT SECTIONS CHANGED TO $1\frac{1}{2}$" WAS 1".



9015A, RIGHT HAND LOCK ROD WITH LOCK PLATE **RC**, CLOSED POINT SIDE
9015B, LEFT HAND " " " " " **LC**, " " "

SAE 1020 - STEEL FORGED

OTHERWISE SAME AS 9015 A & B.

9015C, RIGHT HAND LOCK ROD WITH LOCK PLATE **RO**, OPEN POINT SIDE
9015D, LEFT HAND " " " " " **LO**, " " "

NOTES:

FOR USE WITH LOCKING DOGS 2 3/16" WIDE.
1 - PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH SIGNAL AND TRAIN CONTROL COMMITTEE INSTRUCTION 350.
2 - LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS, FREE FROM BURRS AND HAVE STRAIGHT EDGES.
3 - ALL NUTS TO BE SAE-1020, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.

0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

LOCK ROD COMPL.				L	X	S	GAUGE TO SW. MACH	WEIGHT OF RAIL	ZONE
R.H. CLOSED PT. ROD 9015 A	L.H. CLOSED PT. ROD 9015 B	R.H. OPEN PT. ROD 9015 C	L.H. OPEN PT. ROD 9015 D						
REF. NO.	REF. NO.	REF. NO.	REF. NO.						
9015 A1	9015 B1	9015 C1	9015 D1	6'-11"	4'-6"	½"	36"	105, 112, 127	ELECTRIC
" A2	" B2	" C2	" D2	"	"	2½"	"	112, 127	EXTERIOR
" A3	" B3	" C3	" D3	8'-1"	5'-8"	2½"	50"	105, 112, 127	ELECTRIC & EXTERIOR

LOCK RODS
G.R.S. 4A SWITCH MACHINE
SWITCH, SINGLE SLIP, PT. DERAIL.

SIGNAL ENGR.

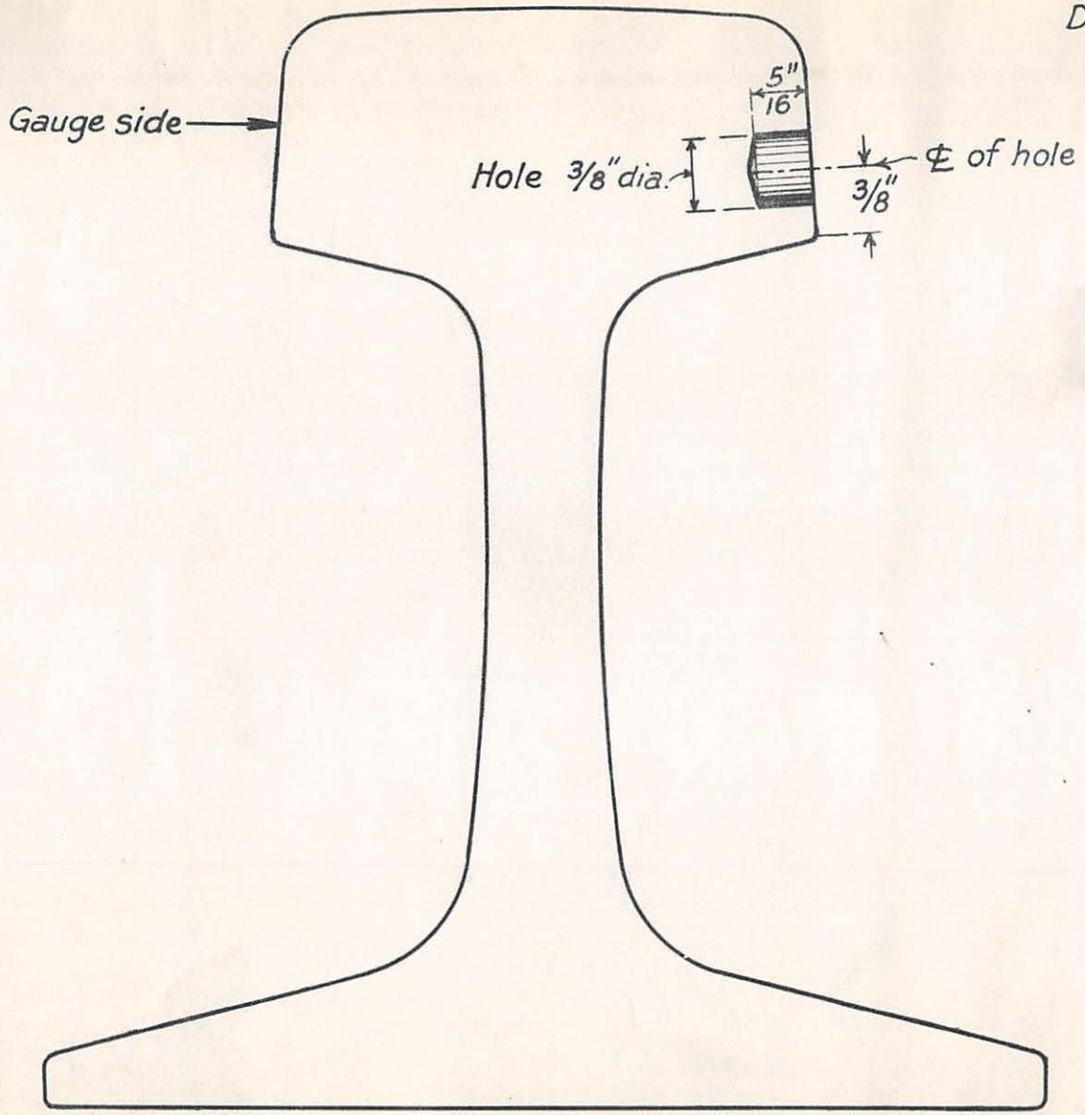
N.Y.C.R.R.
BUFFALO & EAST

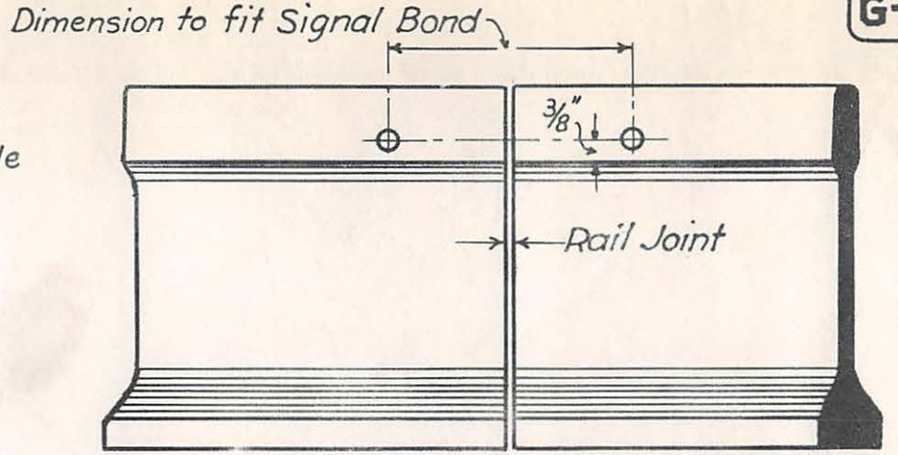
9015

1-31-41

Issue	Date
1	11-11-35

EC
G-25





NOTE:
Dimensions shown must not be exceeded

NEW YORK CENTRAL SYSTEM
STANDARD
LOCATION OF HOLE FOR RAIL-HEAD-PLUG SIGNAL BONDS
ON ALL WEIGHTS OF RAIL

R E McAnulty
VICE PRESIDENT

Recommended by:
N.Y.C. SYSTEM – ENGINEERING – COMMITTEE
C. B. Bronson
W. S. Burnett
H. W. Fenno
R. P. Forsberg
O. Gersbach
G. H. Harris
G. A. Kirley
R. L. Latham
L. G. Morphy
W. A. Murray
J. W. Pfau
R. O. Rote
Dr. H. von Schrenk
C. C. Warne
J. V. NEUBERT
Chairman.

T.C.S.

EC
H-2

1	2-17-28

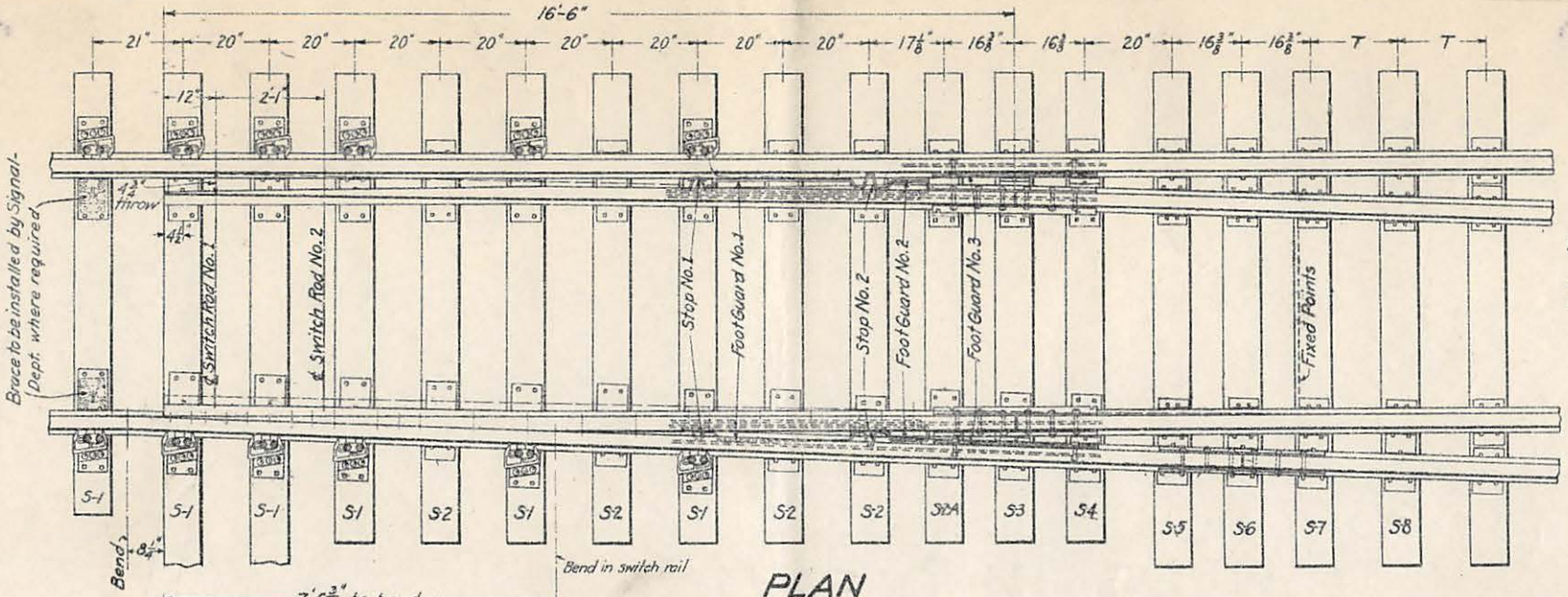
Recommended by:
N. Y. C. LINES
ENGINEERING-
COMMITTEE

H. Ball
Ch. C.C.C. & St. L.
W. C. Bower
Mgr. Purch. & Stores
C. B. Bronson
Asst. Inspecting Engr.
J. F. Deimling
Ch. Engr. M. C.
R. A. Fekles
Ch. Engr. I. H. B.
F. B. Freeman
Ch. Engr. N.Y.C. East
O. H. Garstbach
Ch. Engr. C. Jct. & E.R. & I.
G. A. Kirley
Ch. Engr. B. & A.
L. G. Murphy
Genl. Supt. & Ch. Engr. Rut.
A. R. Raymer
Asst. V.P. & Ch. Engr. P.&L.E.
R. O. Pate
Ch. Engr. N.Y.C. West
J. A. [illegible]
Ch. Engr. N.Y.C.-O.C.L.
Dr. [illegible] Schrenk
[illegible] Engr.
J. V. Neubert
Chairman.

BILL OF MATERIAL

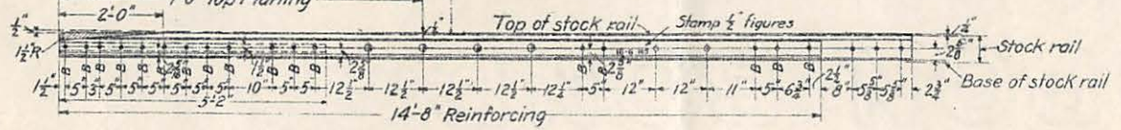
NAME	MARK	NO.
Point	R	1
"	L	1
Clip	Cp	4 ×
Stop	Sp1	2
"	Sp2	2
Foot Guard	Fg1	2
" "	Fg2	2
" "	Fg3	2
Rod	R1	1
"	R2	1
Brace	Br	12
Switch Plate	S-1	12
" "	S-2	8
" "	S-2A	2
Heel Plate	S-3	2
" "	S-4	2
Turnout Plate	S-5	2
" "	S-6	2
" "	S-7	2
" "	S-8	2

× 2 R.H. & 2 L.H. Required.

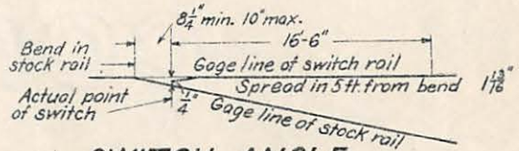

16'-6"
21" 20" 20" 20" 20" 20" 20" 20" 20" 17⅛" 16⅜" 16⅜" 20" 16⅜" 16⅜" T T
12" 2-1"
4½" throw
4½"
Brace to be installed by Signal Dept. where required
4 Switch Rod No. 1
4 Switch Rod No. 2
Stop No. 1
Foot Guard No. 1
Stop No. 2
Foot Guard No. 2
Foot Guard No. 3
Fixed Points
S-1 S-1 S-1 S1 S2 S1 S-2 S-1 S-2 S-2 S2A S3 S4 S-5 S6 S7 S8
Bend 8¼"
Bend in switch rail

PLAN

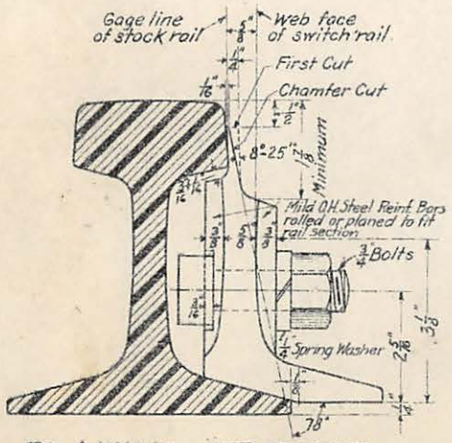
Note:
See Turnout and Crossover layouts for spacing of ties indicated by letter "T".



ELEVATION


8¼" min. 10" max.
16'-6"
Bend in stock rail
Gage line of switch rail
Spread in 5 ft. from bend 1 1/16"
Actual point of switch
¼"
Gage line of stock rail

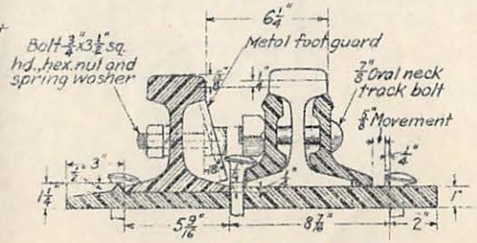
SWITCH ANGLE



PLANING AT POINT

GENERAL NOTES

Spread at heel 6¼". Switch angle 1°44'-11"
Chamfer cut for switch point 1/16" thick and run out in 2'-0" from end of point.
Reinforcing bars shall be secured by ¾" rivets except where bolts are used as indicated by letter "B".
Bolts shall have a clearance of not more than 1/16" in drilled holes. The nuts shall have U.S. standard thread and unless otherwise specified shall be hexagonal and fitted with high spring pressure washers.
For details of switch fittings see Plan EC H-4.
For details of switch, heel and turnout plates see Plan EC H-23.



SECTION AT HEEL

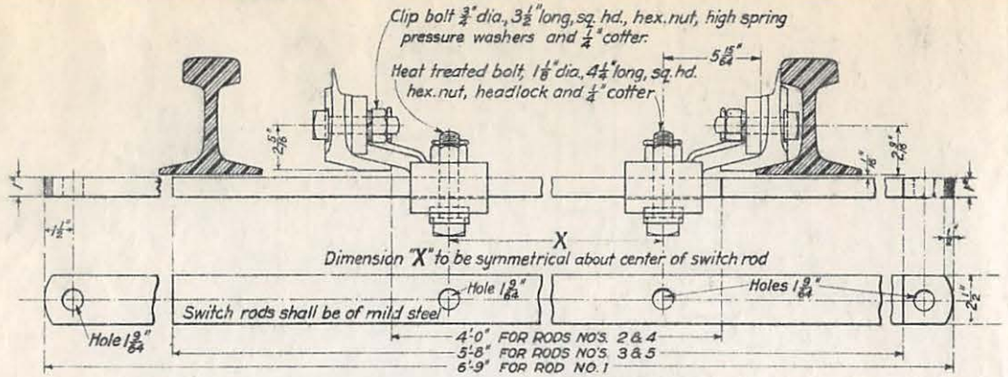
NEW YORK CENTRAL LINES
STANDARD
16'-6" SPLIT SWITCH
WITH UNIFORM RISERS
105 LB. DUDLEY RAIL

PRESIDENT

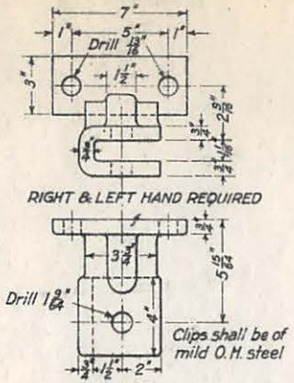
Issue	Date
1	2-17-28

Recommended by:
N. Y. C. LINES ENGINEERING-
COMMITTEE
H. Baldwin
Engr. C.C.C. & St. L.
W. Bower
Mgr. Purch. & Stores
C.B. Bronson
Asst. Inspecting Engr.
J.F. Deimling
Ch. Engr. M.C.
R.A. Feldes
Ch. Engr. I.H.B.
F.B. Freeman
Ch. Engr. N.Y.C. East
O.H. Gersbach
Ch. Engr. C. Jct. & C.R. & I.
G.A. Kirley
Ch. Engr. B. & A.
L.G. Morphy
Genl. Supt. & Ch. Engr. Rut.
A.R. Raymer
Asst. V.P. & Ch. Engr. P. & L.E.
Pote
Engr. N.Y.C. West
J.A. Stocker
Engr. N.Y.C.-O.C.L.
Dr. H. Von Schrenk
Cons. Timber Engr.
J.V. Neubert
Chairman.

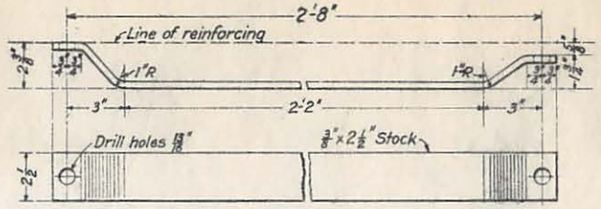
EC
H-4


Clip bolt ¾" dia., 3½" long, sq. hd., hex. nut, high spring pressure washers and ¼" cotter.
Heat treated bolt, 1⅛" dia., 4¼" long, sq. hd. hex. nut, headlock and ¼" cotter
5 15/64"
X
Dimension "X" to be symmetrical about center of switch rod
Hole 1 9/64"
Holes 1 9/64"
Switch rods shall be of mild steel
Hole 1 9/64"
4'-0" FOR RODS NO'S. 2 & 4
5'-8" FOR RODS NO'S. 3 & 5
6'-9" FOR ROD NO. 1

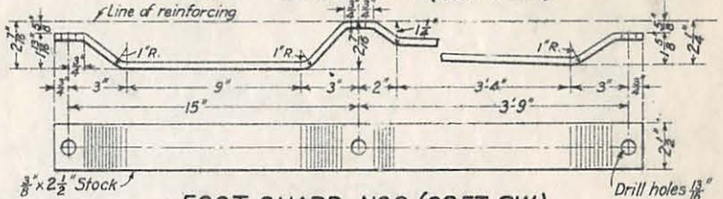
SWITCH ROD WITH CLIPS



CLIP

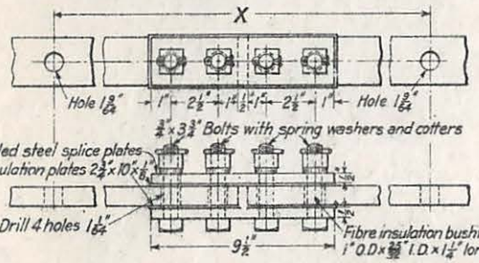


FOOT GUARD Nº 1 (30 FT. SW.)

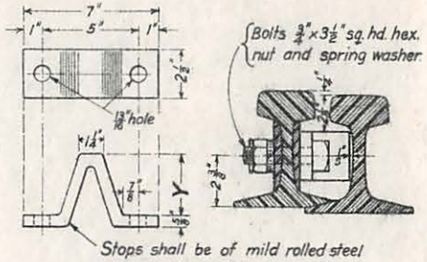


FOOT GUARD Nº 2 (30 FT. SW.)

DIMENSION "X" OF TIE RODS					
SWITCH	Nº 1	Nº 2	Nº 3	Nº 4	Nº 5
30'-0"	3'-3 9/16"	3'-3 61/64"	3'-4 29/32"	3'-5 57/64"	3'-5 53/64"
16'-6"	3'-3 9/16"	3'-4 15/64"			

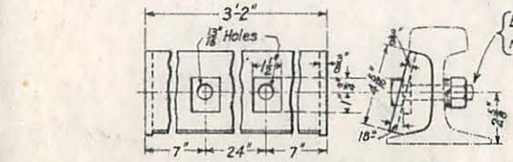


SWITCH ROD WITH INSULATED JOINT



DIMENSION "Y" OF STOPS			
SWITCH	Nº 1	Nº 2	Nº 3
30'-0"	1 31/32"	3"	4 1/16"
16'-6"	2¼"	3½"	

STOPS



FOOT GUARD Nº 1 (16'-6" SW.)

FOOT GUARD Nº 2 (16'-6" SW.)

FOOT GUARD Nº 3
(16'-6" & 30' SWITCHES)

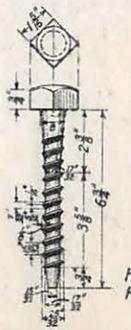
GENERAL NOTES:

Unless otherwise noted, bolts shall have a clearance of not more than 1/16" in drilled holes. The nuts shall have U.S. standard thread and unless otherwise specified shall be hexagonal and fitted with high spring pressure washers.

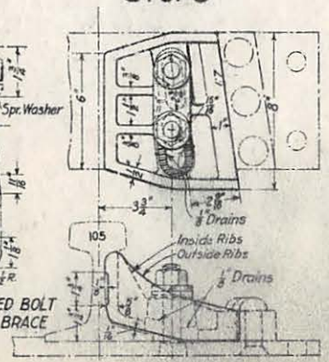
The designation shown on plans EC-112 & H3, together with weight of rail, shall be stamped with ½" figures or letters on each piece.

All foot guards shall be of rolled steel.

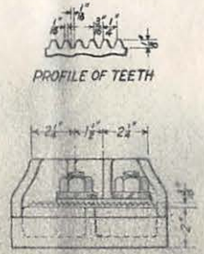
Reinforcing straps to Nº1 rod for attachment to clips may be provided and used when required by Signal Dept. on interlocked switches.

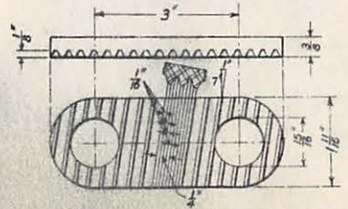


LAG SCREW



ADJUSTABLE BRACE
(To be malleable iron casting)





SERRATED WASHER

Note: Other switch rail braces of approved design may be used.

NEW YORK CENTRAL LINES
STANDARD SWITCH DETAILS
105 LB. DUDLEY RAIL
16'-6" & 30'-0" SWITCHES

Rep

PRESIDENT

Issue	Date
1	2-11-28

EC
H23

Recommended by:
N. Y. C. LINES
ENGINEERING-
COMMITTEE

Baldwin
Ch. Engr. CCC & St. L.
W. C. Bower
Mgr. Purch. & Stores
C. B. Bronson
Asst. Inspecting Engr.
J. F. Deimling
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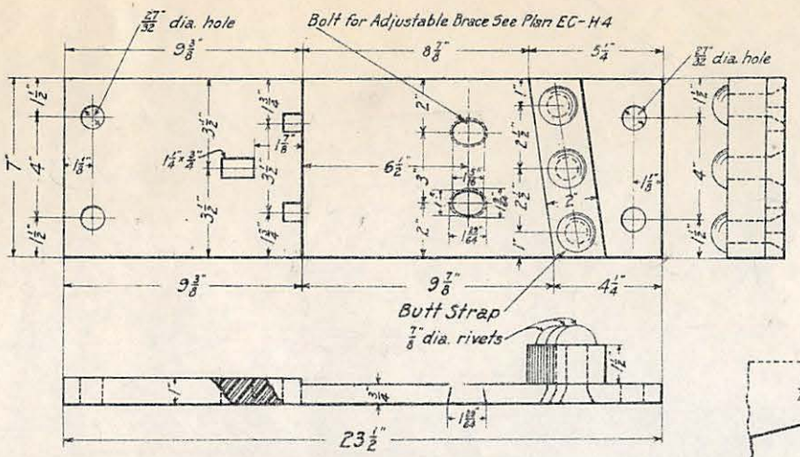
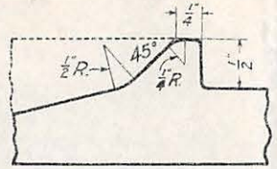
Chairman.

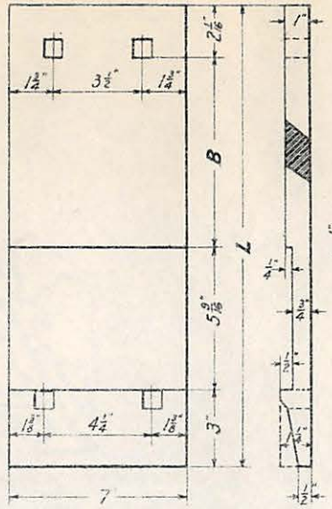


END VIEW

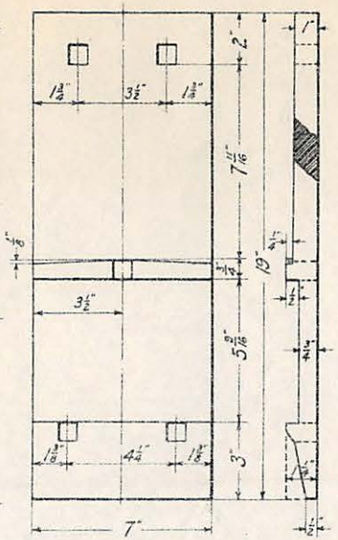
No. 1 SLIDE PLATE
FOR 16'-6" & 30'-0" SWITCHES



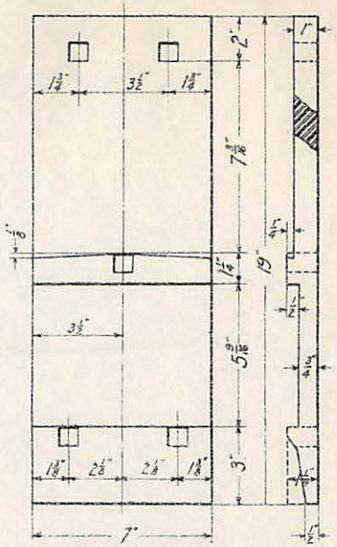
DETAIL OF SHOULDER



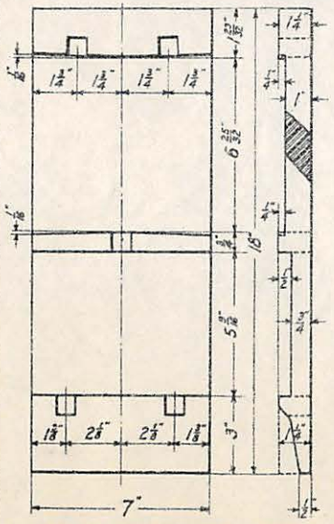
NOS. 2 & 2A SLIDE PLATE
FOR 16'-6" & 30'-0" SWITCH



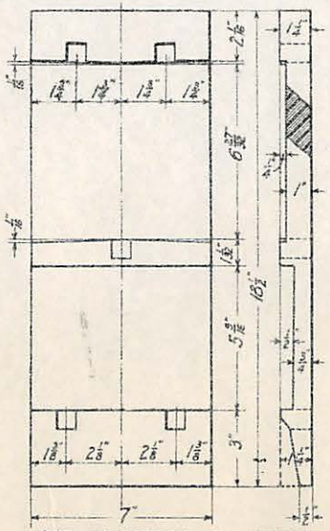
NO. 3 HEEL PLATE
FOR 16'-6" SWITCH ONLY



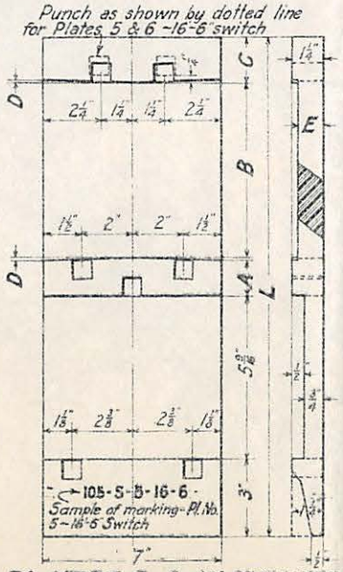
NO. 4 HEEL PLATE
FOR 16'-6" SWITCH ONLY



NO. 3 HEEL PLATE
FOR 30'-0" SWITCH



NO. 4 HEEL PLATE
FOR 30'-0" SWITCH



PLATES 5-8-16'-6" SWITCH
" 5-12-30'-0" "

DIMENSIONS & WEIGHTS OF PLATES

PLATE	NO. REQD	WT. LBS	L	A	B	C	D	E
			inches					
16'-6" SWITCHES								
S-1	12	44.55	23 1/2	—	—	—	—	—
S-2	8	30.76	18	—	7 3/8	—	—	—
S-2A	2	32.74	19	—	8 3/8	—	—	—
S-3	2	32.88	19	—	—	—	—	—
S-4	2	33.13	19	—	—	—	—	—
S-5	2	33.02	18 1/2	1 15/16	5 7/8	2 1/8	1/8	1
S-6	2	33.58	19	2 9/16	5 3/4	2 1/8	5/32	15/16
S-7	2	34.23	19 1/2	3 1/4	5 9/16	2 1/8	5/32	7/8
S-8	2	35.32	20 1/4	4	5 5/8	2 1/8	5/32	13/16
30'-0" SWITCHES								
S-1	16	44.55	23 1/2	—	—	—	—	—
S-2	20	30.76	20 3/4	—	—	—	—	—
S-2A	2	30.76	18	—	7 3/8	—	—	—
S-3	2	31.76	18	—	—	—	—	—
S-4	2	32.97	18 1/2	—	—	—	—	—
S-5	2	30.68	17 1/2	1 1/32	5 9/16	2 1/32	1/16	1
S-6	2	31.62	18	1 3/4	5 9/16	2 1/8	1/16	31/32
S-7	2	31.89	18 1/4	2 1/32	5 9/16	1 31/32	1/16	15/16
S-8	2	32.78	18 3/4	2 13/32	5 9/16	2 1/32	1/16	29/32
S-9	2	33.68	19 1/4	3 1/16	5 9/16	2 1/16	1/16	7/8
S-10	2	34.62	19 3/4	3 17/32	5 9/16	2 3/32	1/16	27/32
S-11	2	35.52	20 1/4	4	5 9/16	2 1/16	1/16	13/16
S-12	2	36.32	20 3/4	4 1/2	5 9/16	2 1/8	3/32	25/32

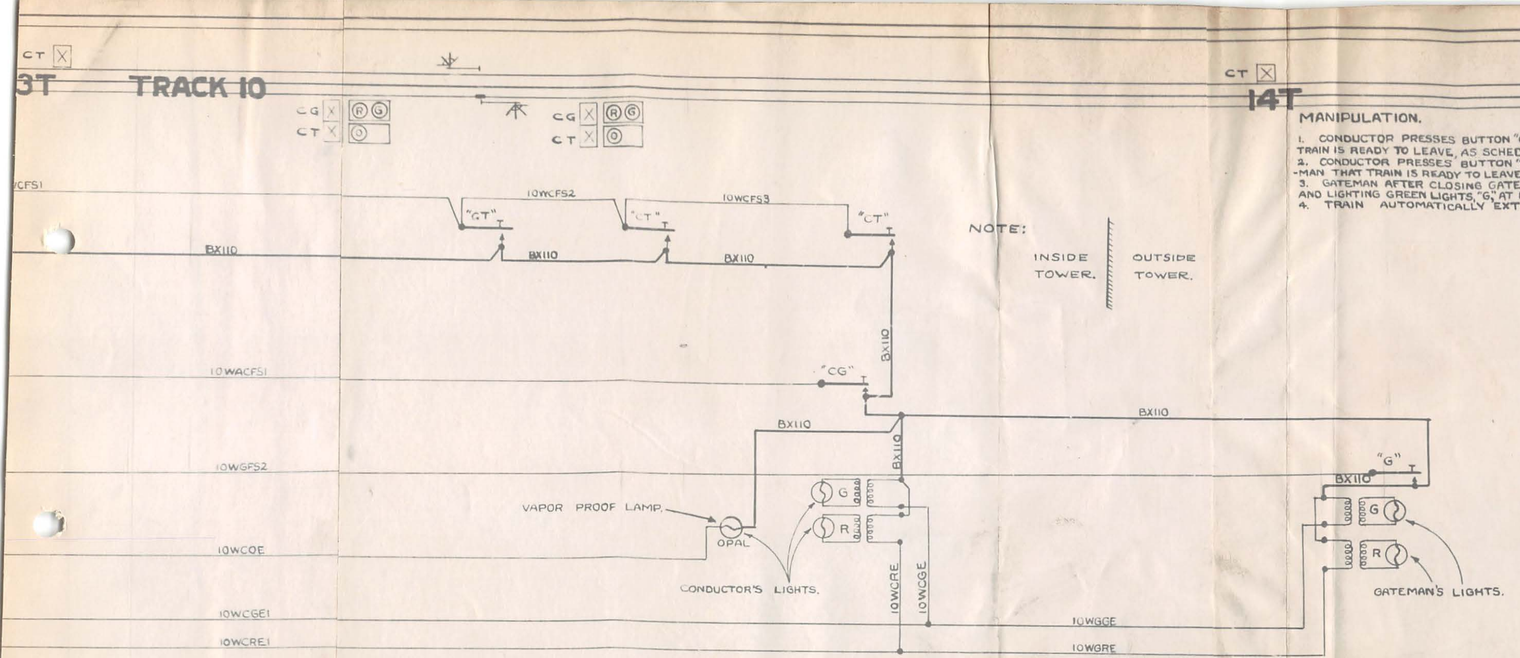
Note: Add 2.64 lbs for shoulder shown as optional

GENERAL NOTES

Spike Holes- All spike holes shall be punched 3/4" square unless noted, with corners rounded to 1/16" radius.
Marking- Stamp designation on plates as shown with 1/2" figures; for example, Plate No. 5, 16'-6" switch:- 105-5-5-16-6".

NEW YORK CENTRAL LINES
STANDARD
DETAILS OF SWITCH PLATES
FOR 16'-6" & 30'-0" SWITCHES - 105 LB. DUDLEY RAIL

O. H. Brown
PRESIDENT



CT X

"B"

MANIPULATION.

1. CONDUCTOR PRESSES BUTTON "CG" FOR TRACK ON WHICH TRAIN IS DUE TO LEAVE, LIGHTING RED LIGHTS "R" AT PLATFORM AND GATE. THIS NOTIFIES GATEMAN THAT TRAIN IS READY TO LEAVE, AS SCHEDULED, AND GIVES A RECORD OF THE ACTION AT THE PLATFORM.
2. CONDUCTOR PRESSES BUTTON "CT" FOR TRACK ON WHICH TRAIN IS DUE TO LEAVE, LIGHTING OPAL LIGHT "O" AT PLATFORM, AND LIGHT IN TOWER. THIS NOTIFIES TOWER-MAN THAT TRAIN IS READY TO LEAVE, AS SCHEDULED, AND GIVES A RECORD OF THE ACTION AT THE PLATFORM.
3. GATEMAN AFTER CLOSING GATE, ALLOWS SUFFICIENT TIME TO ELAPSE FOR LAST PASSENGER TO REACH TRAIN, THEN PRESSES BUTTON "G" EXTINGUISHING RED LIGHTS "R" AND LIGHTING GREEN LIGHTS "G" AT PLATFORM AND GATE. THIS NOTIFIES CONDUCTOR THAT GATES ARE CLOSED AND GIVES A RECORD OF THE ACTION TO THE GATEMAN.
4. TRAIN AUTOMATICALLY EXTINGUISHES ALL LIGHTS AT SIGNAL "A" OR "B".

C.U.T.
S-502-3
REV. No.

THE CLEVELAND UNION TERMINALS CO.

STARTING PLATFORM - SIGNAL CIRCUITS.

CLEVELAND, OHIO.

OFFICE OF ASSISTANT SIGNAL ENGINEER.

SCALE - NONE.

DATE APRIL 13 1928.

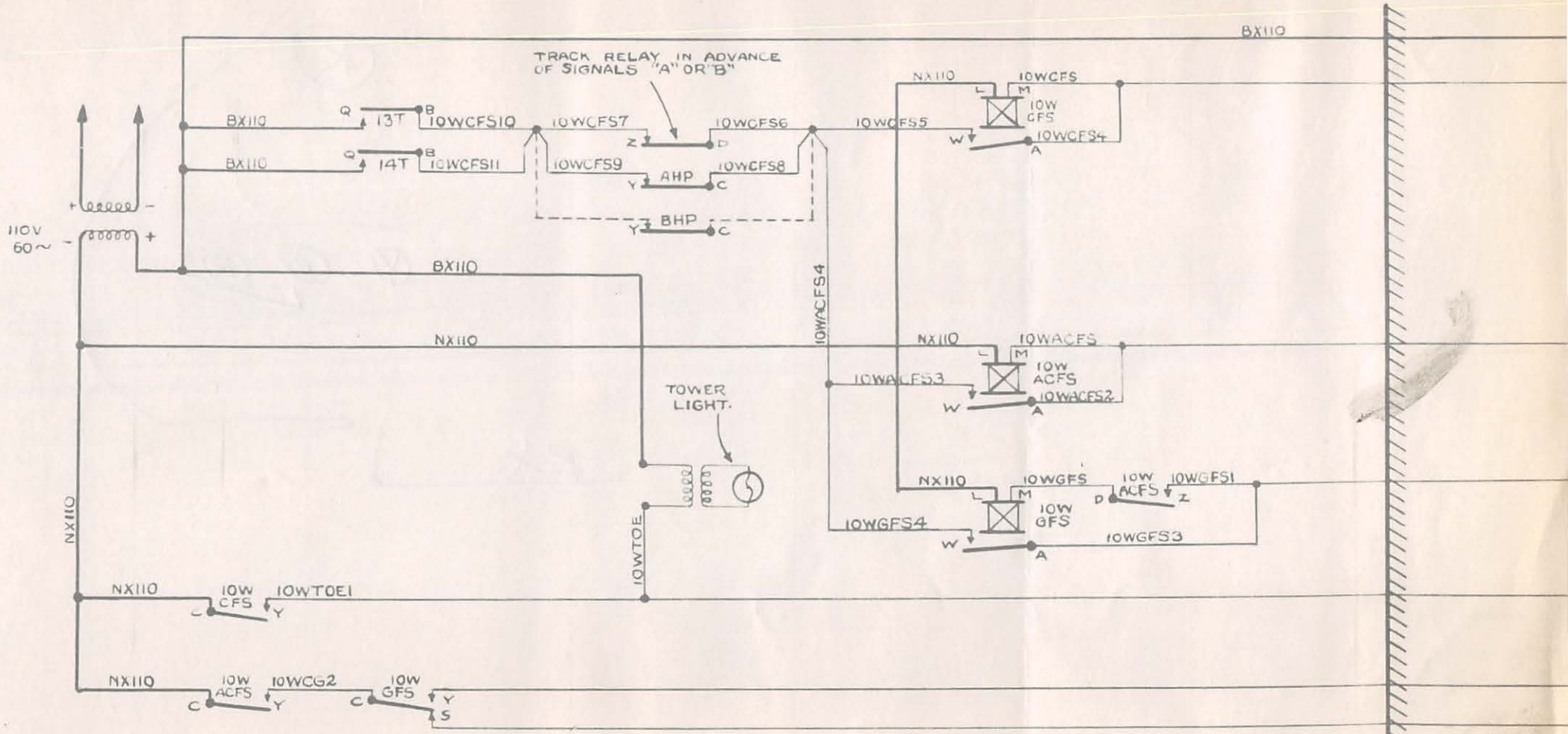
APPROVED C. D. Crook 5/1/28
ASST. SIGNAL ENGINEER.

CHIEF ENGINEER.

REV.	DATE	CHECKED	CORRECT	REFERENCE
				NEW PLAN.

"A"

CT X



IBE.

.0234"

1/4" 1/16" 1/32"

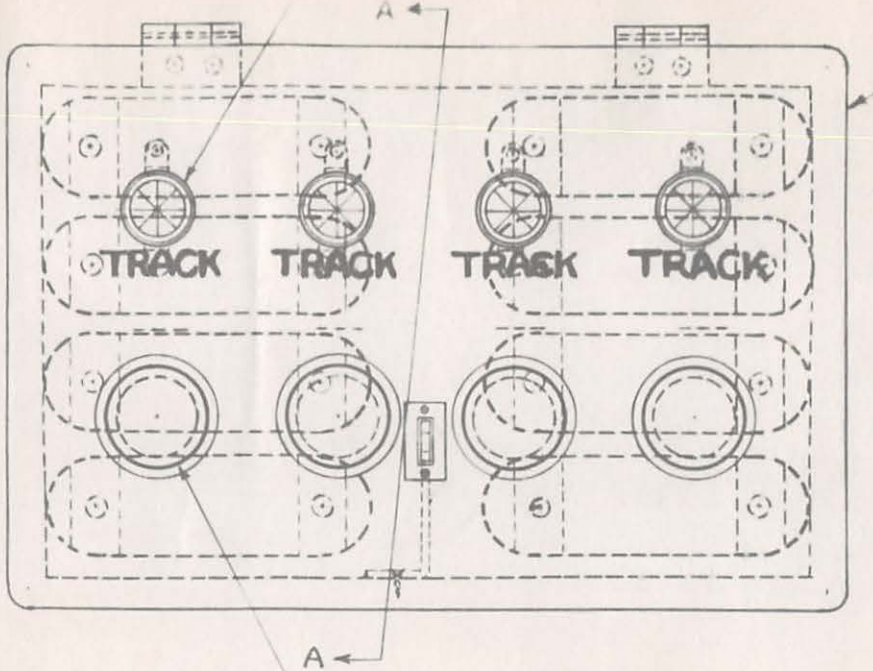
L OF POINT.

RILL.

BRASS

E.

JEWELED RED LAMP CAP
FIG. 4B WESTERN ELECTRIC.



PUSH BUTTON NO. 172
KELLOGG CAT.

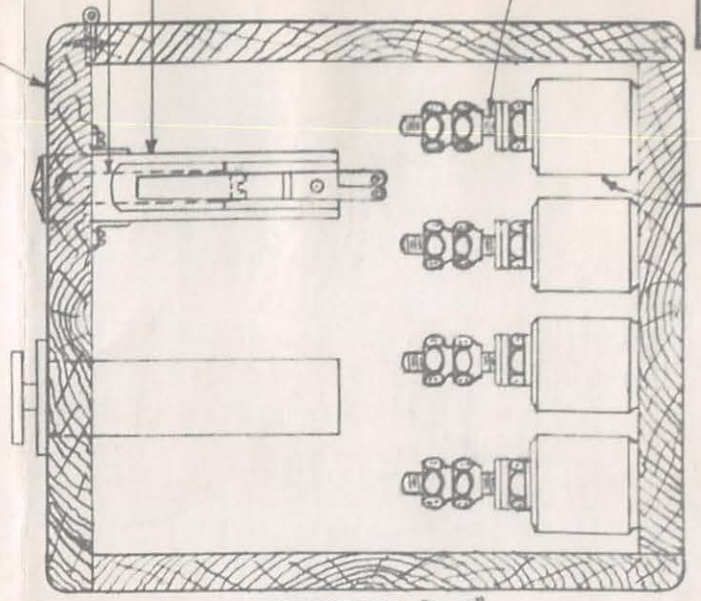
528-11

NO. 2F. SW. BOARD BULB
12V. .09 AMP. W.E. CAT.

NO. 34 SW. BOARD LAMP
SOCKET W.E CAT.

R.S.A. 10705

R.S.A. 10561



SECTION "A-A"

C.U.T.
S-528-1
REV. No.

THE CLEVELAND UNION TERMINALS CO.

INDICATOR CABINET

CLEVELAND, OHIO.

OFFICE OF ASSISTANT SIGNAL ENGINEER.

SCALE - 6" = 1'.

DATE - MAY. 2, 1928.

APPROVED C. D. Crook 5/20/28
ASST. SIGNAL ENGINEER.

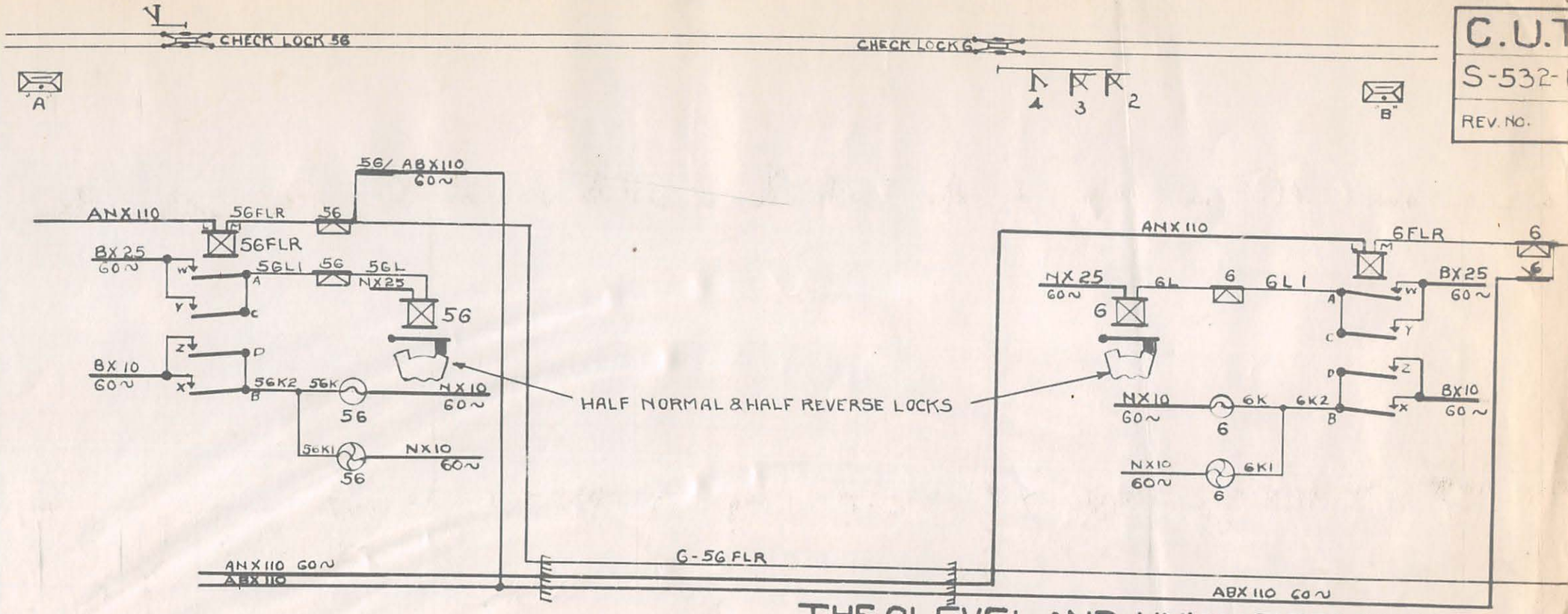
CHIEF ENGINEER.

REV.	DATE	CHECKED	CORRECT	REFERENCE

REV	DATE	CHECKED	REFERENCE

REV	DATE	CHECKED	CORRECT	REFERENCE
		Gas. 5/28	5/28	NEW PLAN

C.U.T
S-532-
REV. NO.



THE CLEVELAND UNION TERMINALS CO.

CHECK LOCK CIRCUITS.

CLEVELAND OHIO.

OFFICE OF ASSISTANT SIGNAL ENGINEER.

SCALE NONE.

DATE MAY 7, 1928.

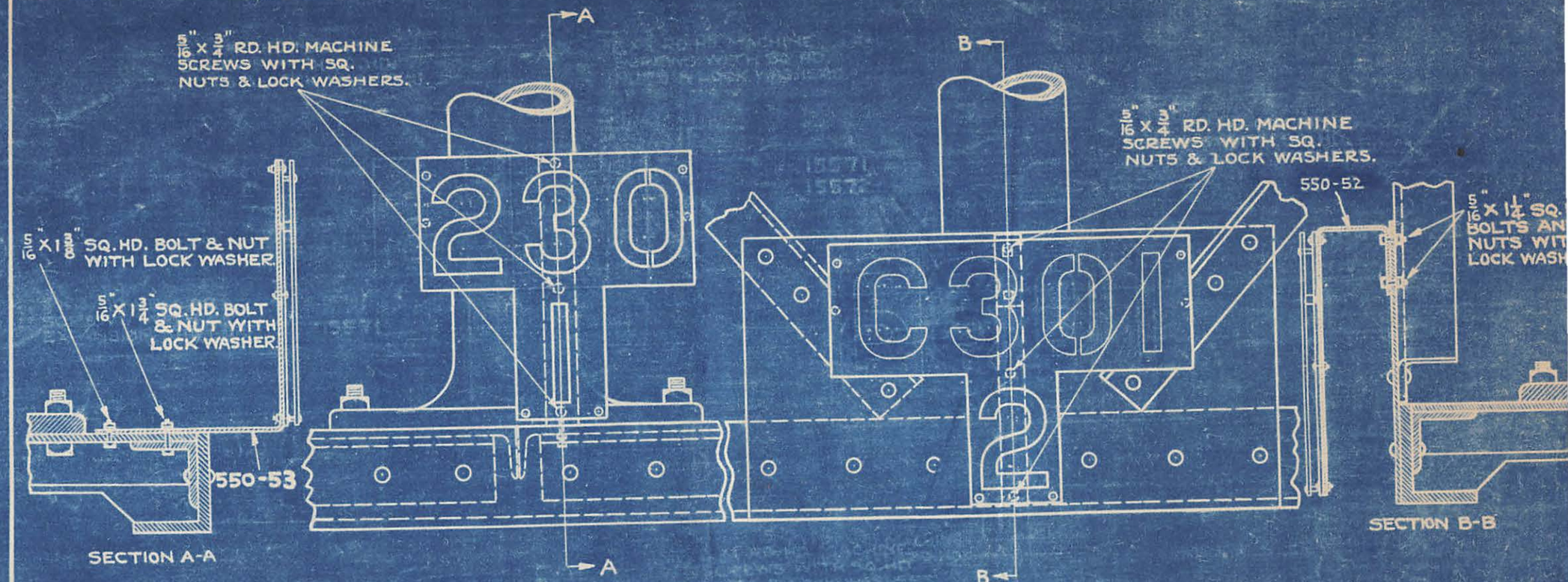
INSIDE TOWER → ← OUTSIDE TOWER

= ILLUMINATED DIAGRAM LIGHT.

= LEVER LIGHT.

APPROVED C.D. Crouch 5/20/28
ASSISTANT SIGNAL ENGINEER

H.D. Jouett 5/2
CHIEF ENG.



SCALE: 1½ IN. = 1 FT.

NOTE:
SIGNAL NUMBER PLATES TO BE SPECIFIED AS REQUIRED.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O

NUMBER PLATE ASSEMBLY

SIGNAL BRIDGES FOR SEMAPHORE SIGNALS.

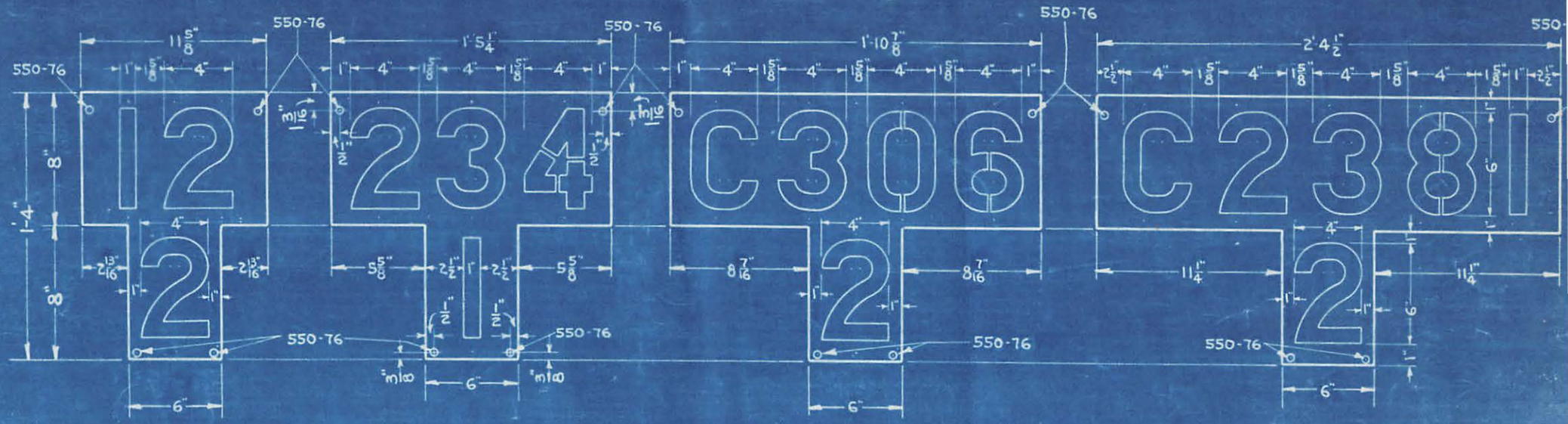
FEB. 9, 1922.

REVISION NO. 4	APRIL 17, 1929.	S-A550-1

SIGNAL ENGINEER

REV.	DATE	CHECKED	CORRECT

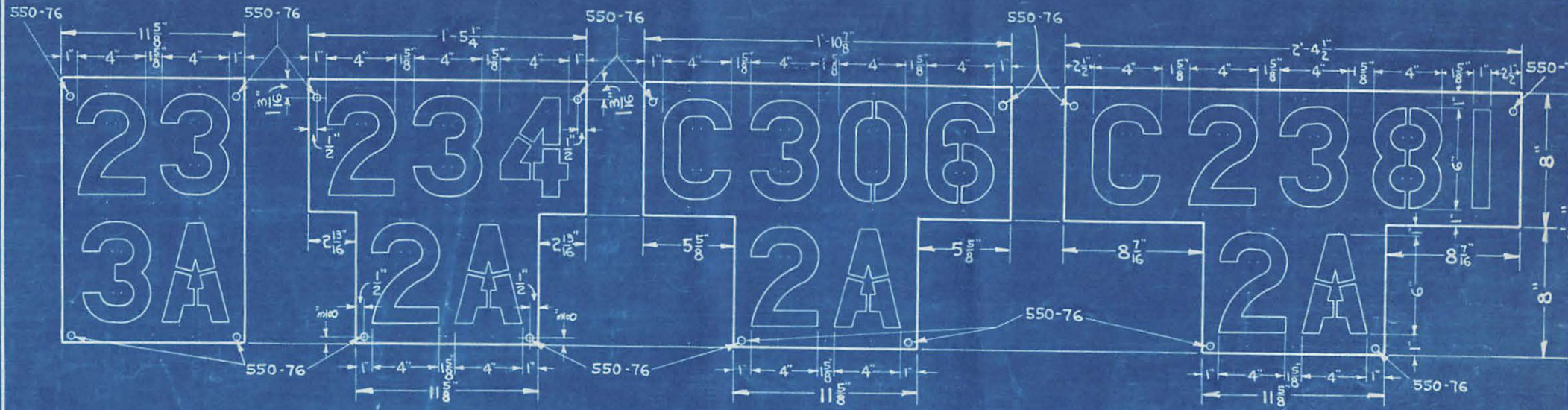
REV.	DATE	CHECKED	CORRECT	
1	2-18-28	[illegible]	[illegible]	REVISED ACCT. REDESIGN OF NUMBERING.
2	4-17-29	[illegible]	[illegible]	PLAN CHANGED TO SHOW PUNCHED INSTEAD OF CAST NUMBERS.


550-76
550-76
550-76

REV.	DATE	CHECKED	CORRECT
	6-18-28	B.G.T.	B.G.T.
	4-17-29	J.C.K.	J.C.K.

REVISED ACCT. REDESIGN OF NUMBERING.

PLAN CHANGED TO SHOW PUNCHED INSTEAD OF CAST NUMBERS.



550-41
FRONT PLATE COMPLETE

550-42
FRONT PLATE COMPLETE

550-43
FRONT PLATE COMPLETE

550-44
FRONT PLATE COMPLETE

NOTES:

MAKE FROM #12 U.S.S. GAGE SHEET IRON.
ALL HOLES TO BE 7/32" DIA.
PLATES TO BE GIVEN 1 COAT OF DUCO PRIMER AND 3 COATS OF BLACK DUCO FINISH.
FOR DETAILS OF PUNCHING FOR NUMERALS AND LETTERS SEE S-A550-8.

SCALE: 1 1/2 IN. = 1 FT.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O

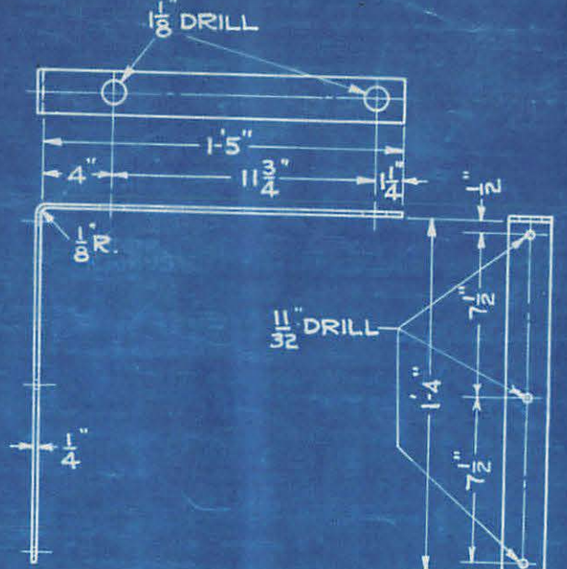
NUMBER PLATE
DETAILS
FRONT PLATE.
FEB. 5, 1922.

REVISION NO. 3	APRIL 17, 1929	S-A550-4

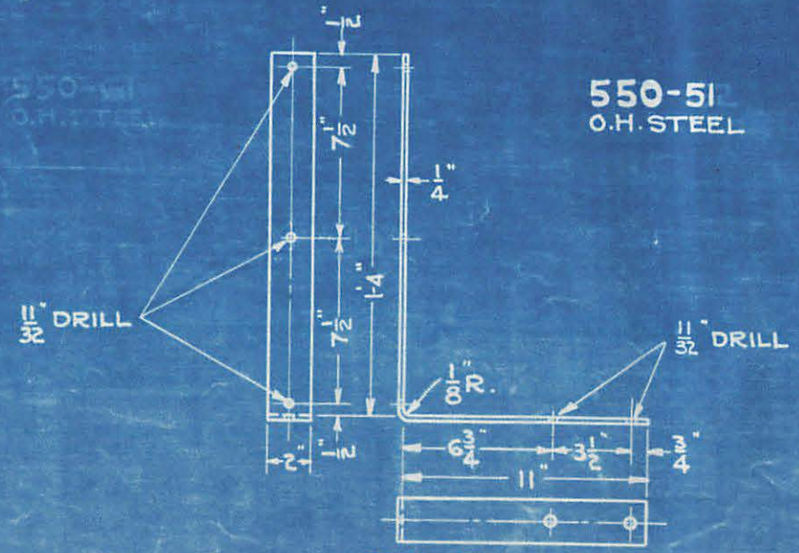
SIGNAL ENGINEER

DATE	CHECKED	CORRECT
6-18-28	A.G.T.	
4-17-29	J.L.K.	

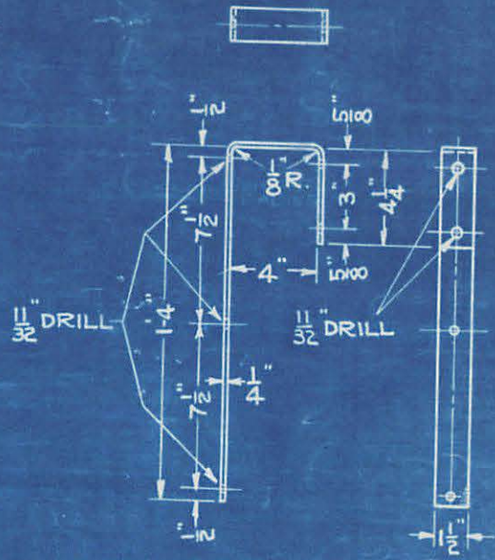
REV.	DATE	CHECKED	CORRECT
REVISED ACCT. REDESIGN OF NUMBERING.			
PLAN REVISED ACCT. CHANGE FROM CAST TO PUNCHED NUMBERS.			



550-51
O.H. STEEL



550-53
O.H. STEEL



550-52
O.H. STEEL

NOTE:
SUPPORTS TO BE GIVEN ONE COAT OF FORMULA "E" AND TWO COATS OF FORMULA "F" PAINT.

SCALE: 1½ IN. = 1 FT.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND,

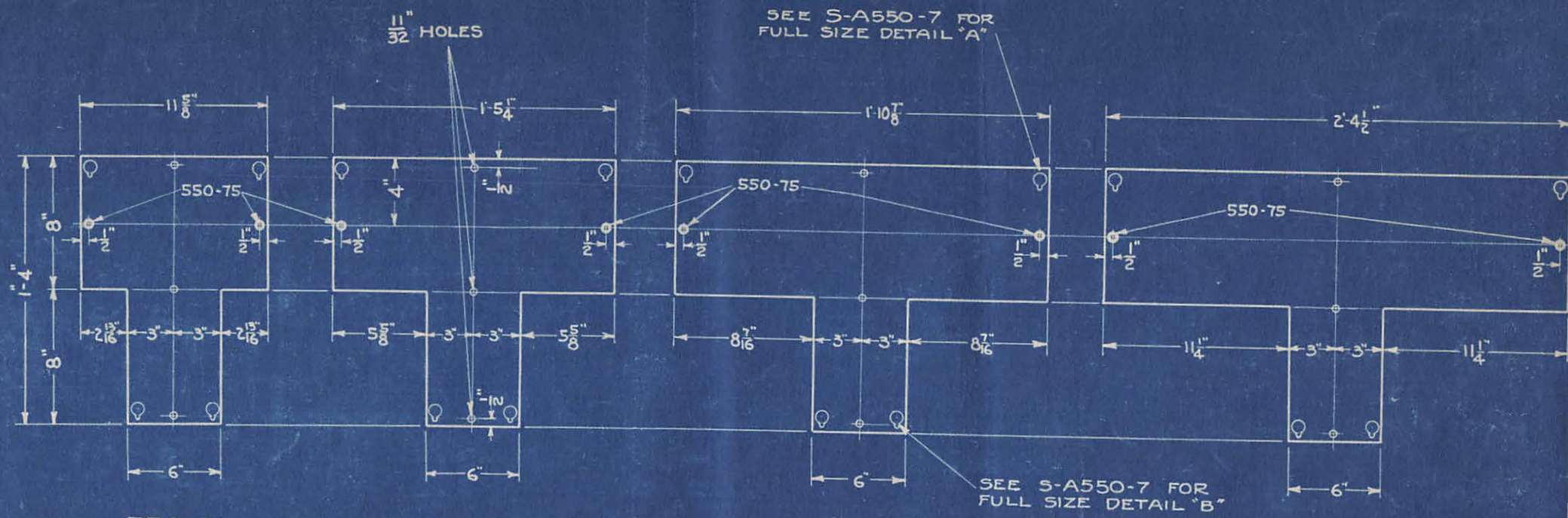
NUMBER PLATE
DETAILS
SUPPORTS
FEB. 5, 1923.

REVISION NO. 2	APRIL 17 1929.	S-A550-5

REV.	DATE	CHECKED	CORRECT

REV.	DATE	CHECKED	CORRECT
2	4-17-29	J.S.K.	Sly

PLAN REVISED ACCOUNT CHANGE FROM CAST TO PUNCHED NUMBERS.



550-61
BACK PLATE COMPLETE

550-62
BACK PLATE COMPLETE

550-63
BACK PLATE COMPLETE

550-64
BACK PLATE COMPLETE

NOTES:

MAKE FROM #12 U.S.S. GAGE SHEET IRON.
PLATES TO BE GIVEN 1 COAT OF DUCO PRIMER AND 3 COATS OF DUCO FINISH.
FRONT, WHITE - BACK, BLACK.

SCALE, 1/2 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND,

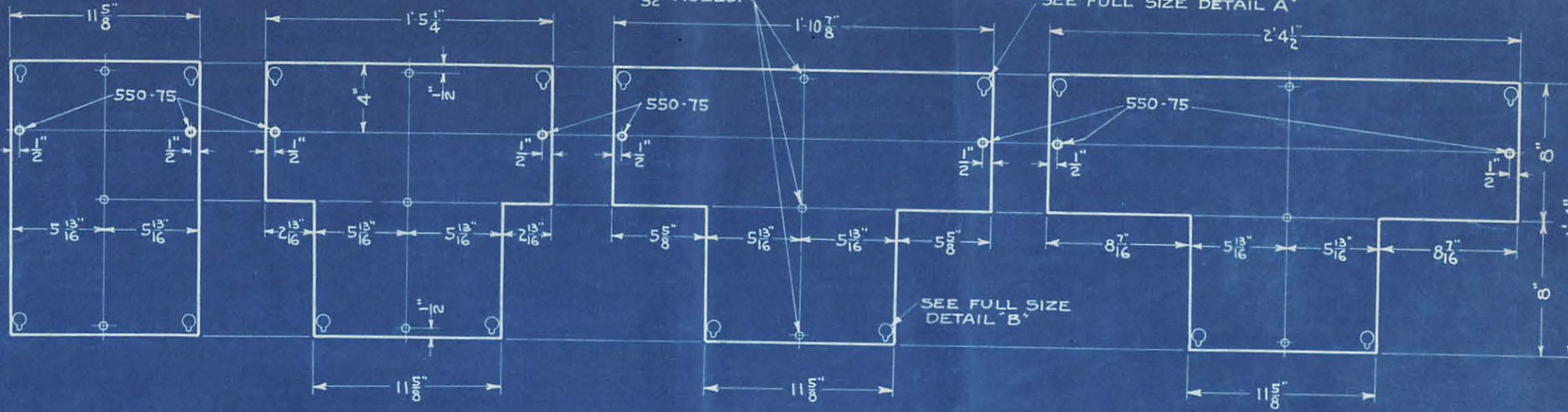
NUMBER PLATE
DETAILS
BACK PLATE.
FEB. 5, 1923.

REVISION NO. 2	APRIL 17, 1929.	S-A550-

SIGNAL ENGINEER

REV.	DATE	CHECKED	CORRECT

REV.	DATE	CHECKED	CORRECT
	4-17-29	J.A.K.	



550-71
BACK PLATE COMPLETE

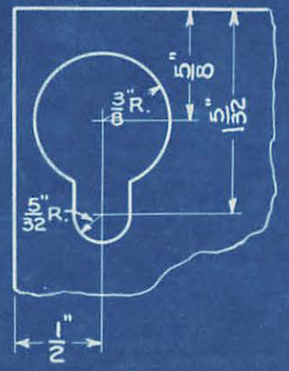
550-72
BACK PLATE COMPLETE

550-73
BACK PLATE COMPLETE

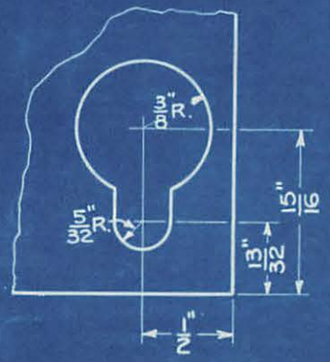
550-74
BACK PLATE COMPLETE

NOTES:

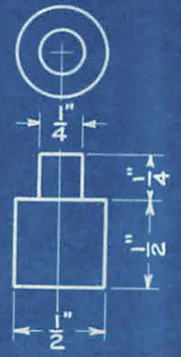
MAKE BACK PLATES FROM #12 U.S.S. GAGE SHEET IRON.
PLATES TO BE GIVEN 1 COAT OF DUCO PRIMER AND 3 COATS OF DUCO FINISH. FRONT, WHITE. - BACK BLACK.



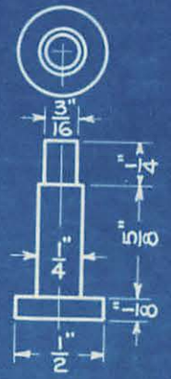
DETAIL "A"



DETAIL "B"



550-75
SPACER
C.R.S.



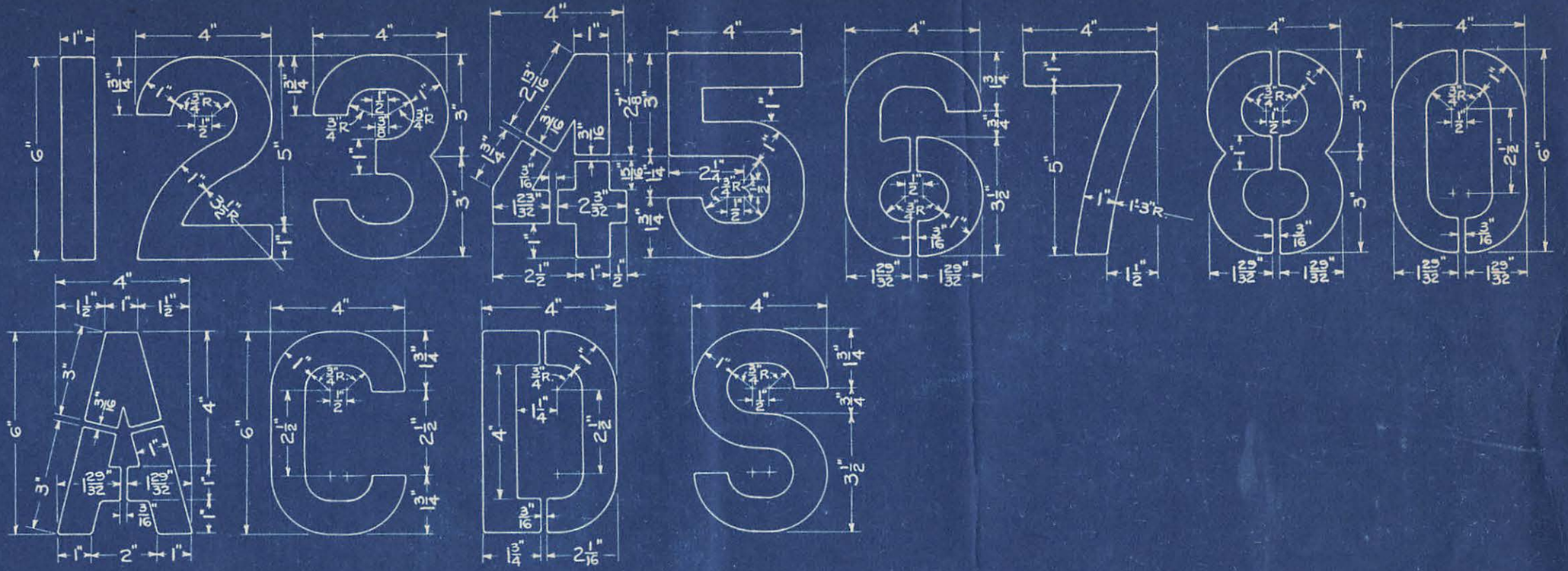
550-76
SUPPORT
C.R.S.

SCALE, 1½ IN. = 1 FT. & FULL SIZE.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O

NUMBER PLATE
DETAILS
BACK PLATE.
APRIL 17, 1929.

REVISION NO.		S-A550-7



SCALE, 3 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

NUMBER PLATE

DETAILS

PUNCHED NUMERALS AND LETTERS

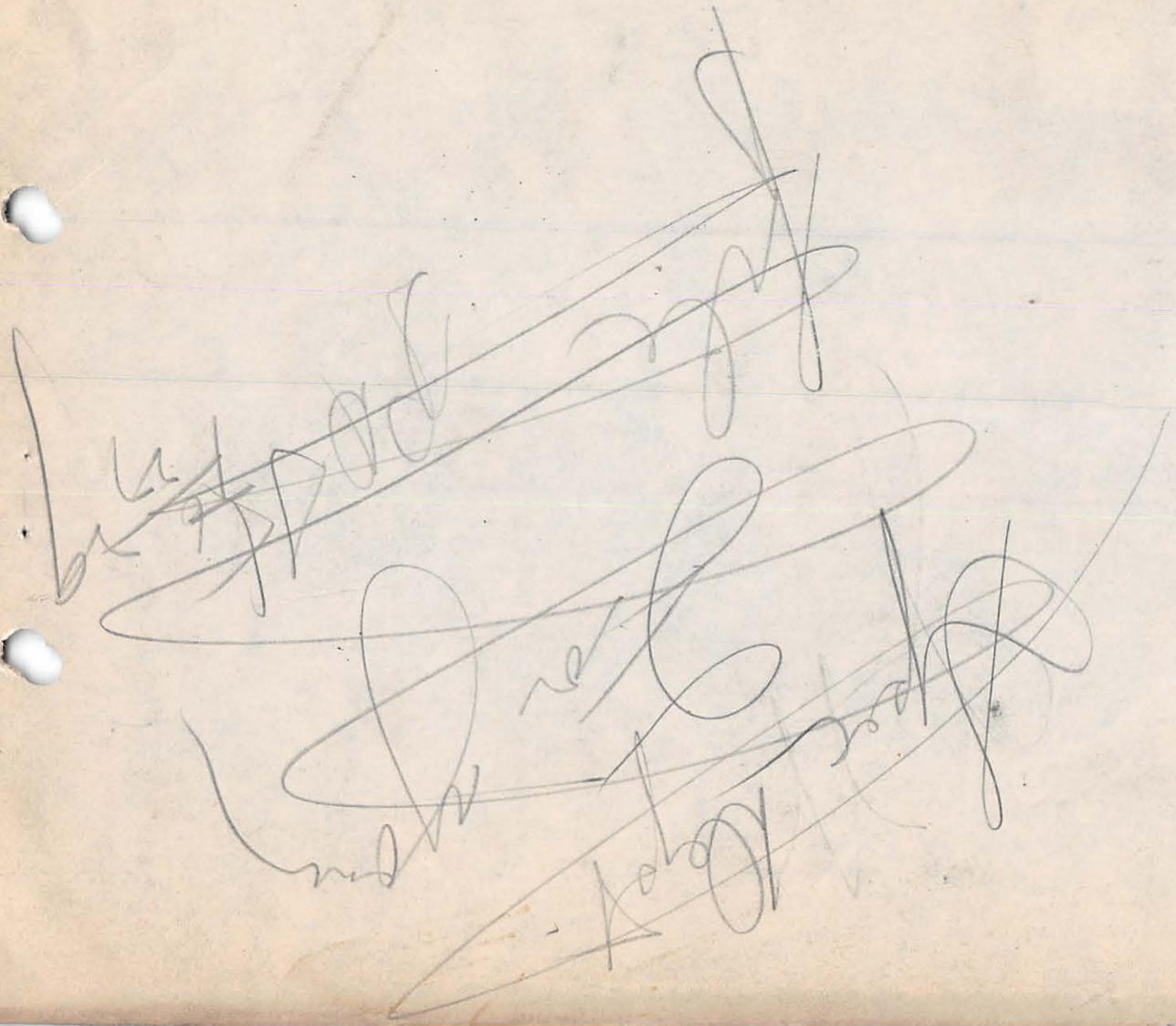
APRIL 17, 1929.

REVISION NO.		S-A550-8

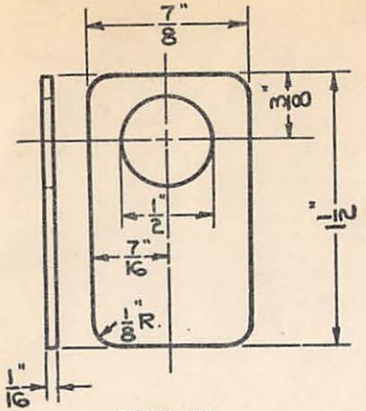
SIGNAL ENGINEER

DATE	CHECKED	CORRECT
4-17-29	J.L.K.	Alf Shilling

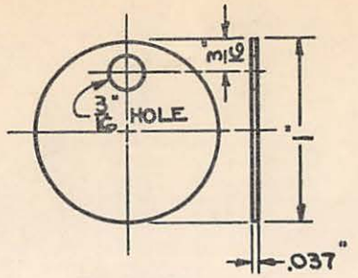
REV.	DATE	CHECKED	CORRECT



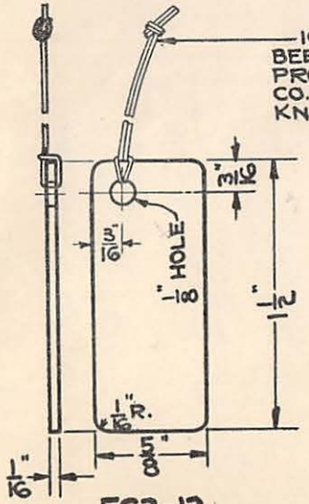
JUN 20 1929
A. M.
NOTE
ATTENTION
Ans'd.....
Date .....



563-11
BLACK FIBRE



563-12
ALUMINUM



10" LENGTH OF #12 END LOCKSTITCH BEESWAXED TWINE, WHICH CAN BE PROCURED FROM THE WESTERN ELECTRIC CO., DOUBLED AND KNOTTED WITH KNOTTED END DIPPED IN SHELLAC.

563-13
BLACK FIBRE

NOTE:—
TAGS 563-11 AND 563-13 TO BE GIVEN ONE COAT OF SHELLAC.

TAGGING:—

TAGS 563-11 ARE TO BE USED ONLY IN MARKING WIRES IN STORAGE BATTERY RECEPTACLES AND ARE TO BE SLIPPED ON WIRES AND NOT TIED TO SAME.

TAGS 563-12 ARE TO BE USED ONLY FOR MARKING LINE WIRES AND ARE TO BE FASTENED BY NAILING TO CROSS ARMS DIRECTLY UNDER THE WIRE AT POINT WHERE WIRE TAPS OR TERMINATES.

TAGS 563-13 SHALL BE USED AT ALL OTHER PLACES AND FASTENED TO WIRES BY #12 END LOCKSTITCH BEESWAXED TWINE.

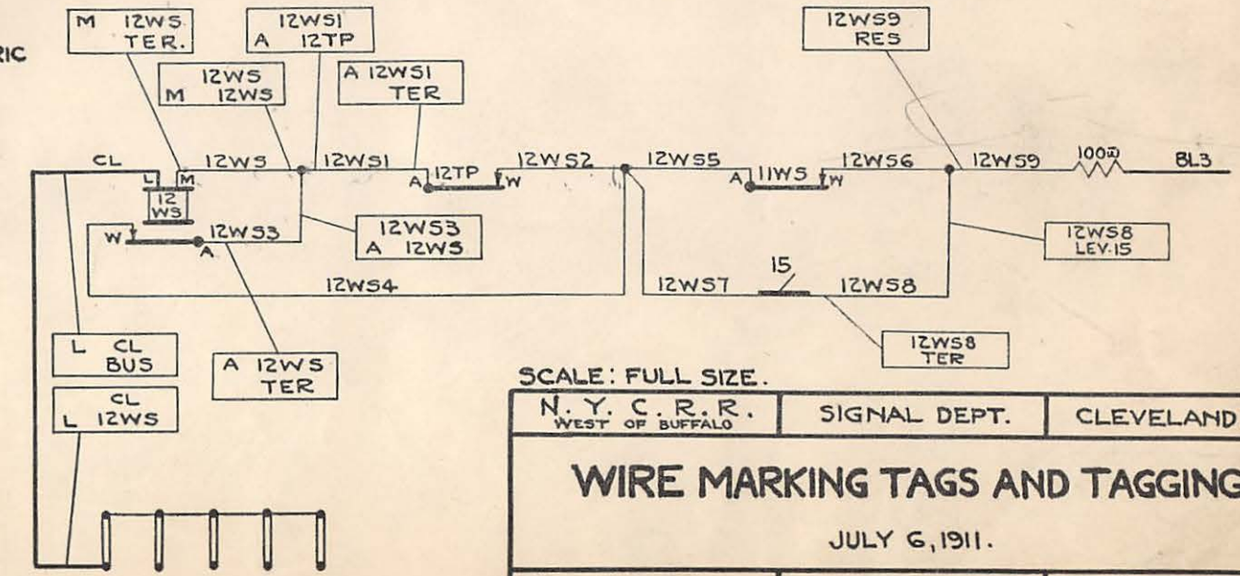
ALL WIRES SHALL BE TAGGED AT ENDS AND AT CROSS LEADS IN MAIN TRUNKING.

TAGS 563-13 SHALL BE PLAINLY STAMPED TO SHOW WIRE NUMBER ON TOP LINE AND DESTINATION ON BOTTOM LINE.

RELAY WIRE NUMBER SHALL BE PRECEDED BY LETTER DESIGNATING RELAY BINDING POST TO WHICH WIRE IS ATTACHED.

LETTERS AND FIGURES SHALL BE ONE-EIGHTH (1/8) INCH HIGH.

STAMPINGS ON TAGS 563-11 AND 563-13 SHALL BE FILLED WITH "FINE BLUE SILVER WHITE JOHN W. MASURY & SON #5979S," OR ITS EQUIVALENT AND SURPLUS WHITENING ON FACE WIPED OFF.



SCALE: FULL SIZE.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

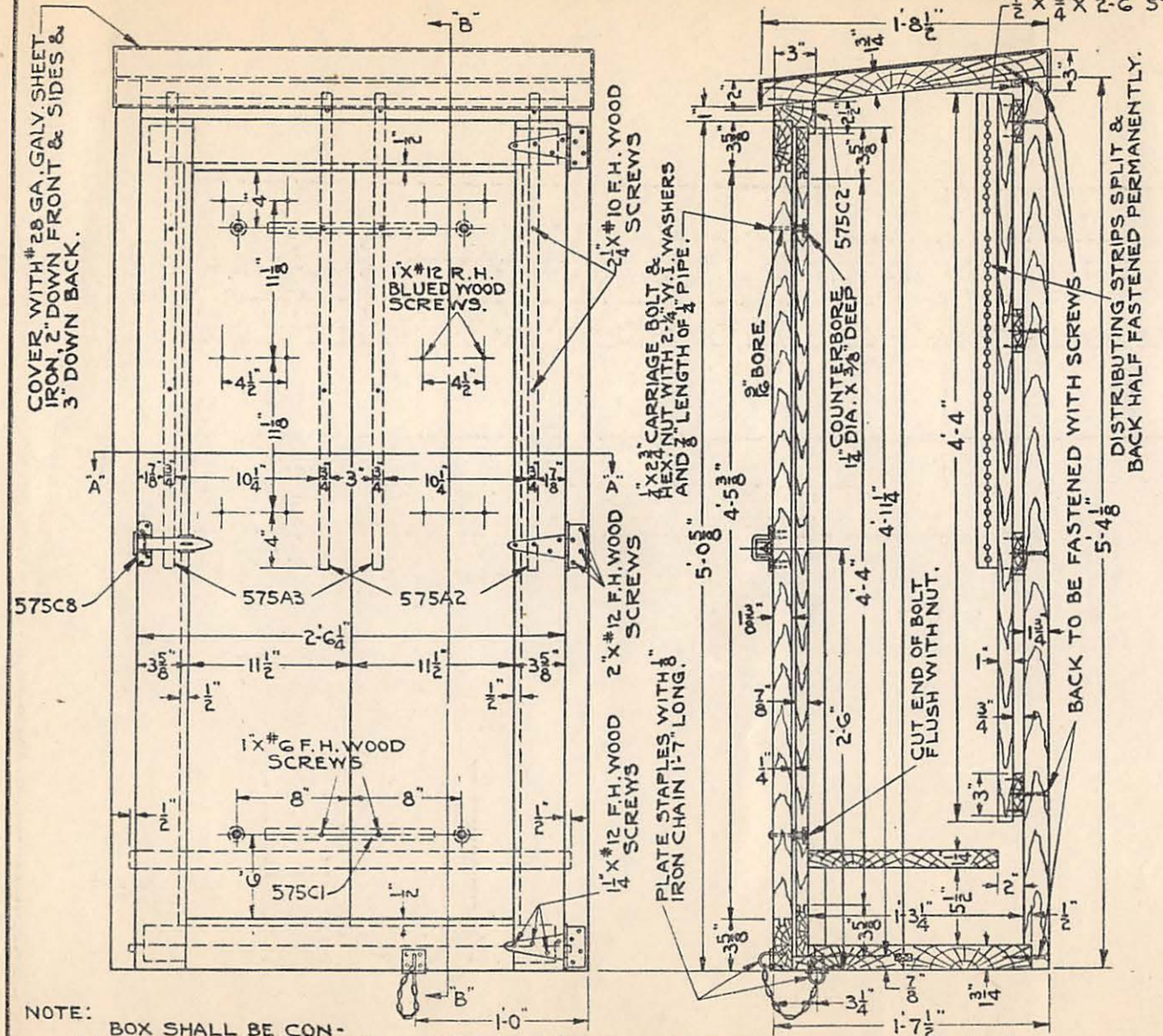
WIRE MARKING TAGS AND TAGGING

JULY 6, 1911.

REVISION NO. 9	JULY 16, 1930.	S-A563-1

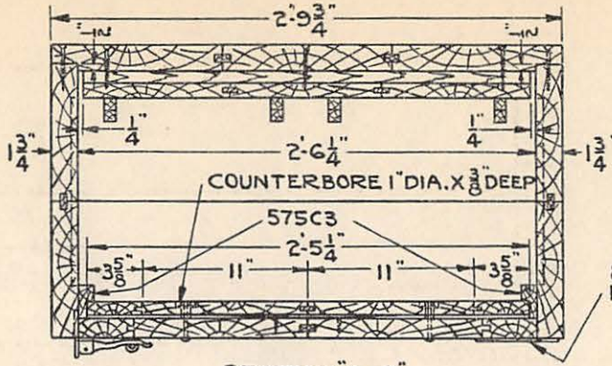
SIGNAL ENGINEER

SCO 100

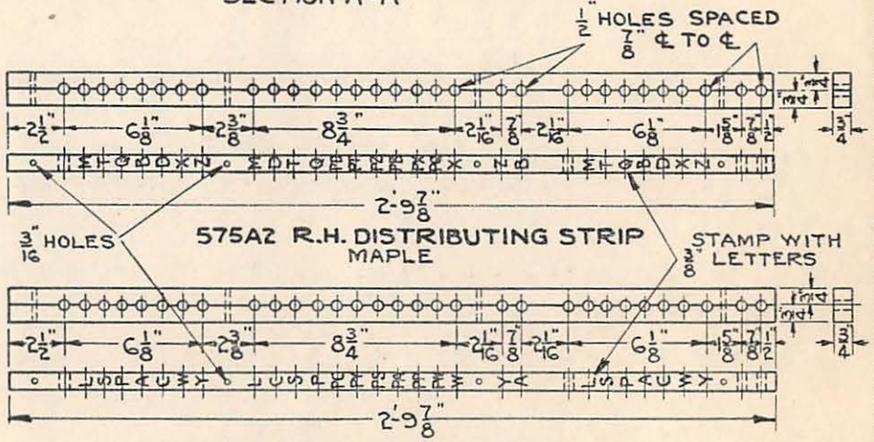


575A1 BOX COMPLETE (WHITE PINE)

SECTION "B-B"



SECTION "A-A"



575A3 L.H. DISTRIBUTING STRIP
MAPLE

NOTE:
BOX SHALL BE CONSTRUCTED OF THOROUGHLY SEASONED WHITE PINE.
INSIDE SHALL BE PAINTED 2 COATS OF WHITE LEAD AND OIL. THE PRIMING COAT SHALL BE APPLIED BEFORE ASSEMBLING.
OUTSIDE SHALL BE PAINTED 1 COAT OF FORMULA "P" PAINT & FINISHING COAT OF FORMULA "F."
ALL JOINTS SHALL BE LAID IN WHITE LEAD.
DISTRIBUTING STRIPS SHALL BE GIVEN 2 COATS OF VARNISH.

no 267

SCALES: 1 IN. & 1½ IN. = 1 FT.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

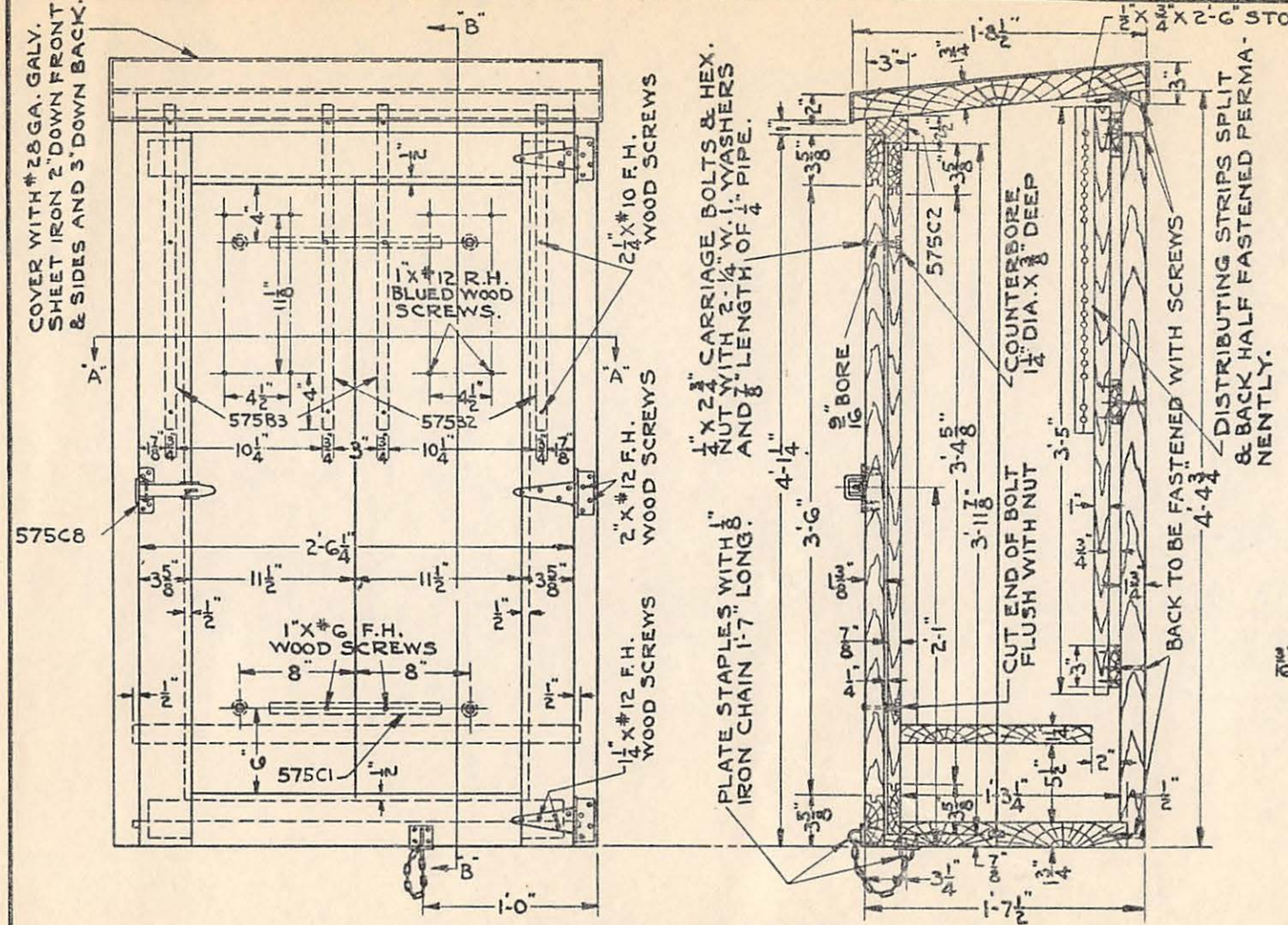
RELAY BOX

6 WAY

FEB. 14, 1917.

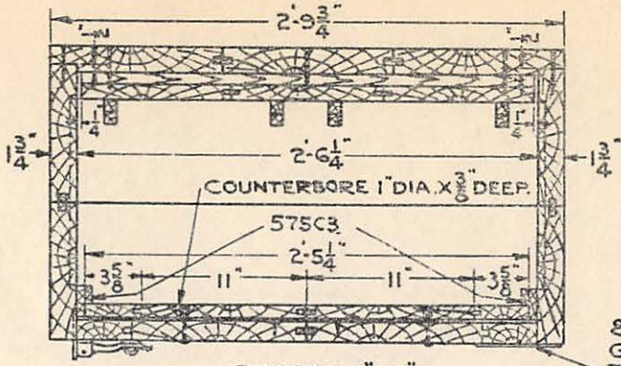
REVISION NO. 16	APRIL 29, 1930.	S-A575A

SIGNAL ENGINEER

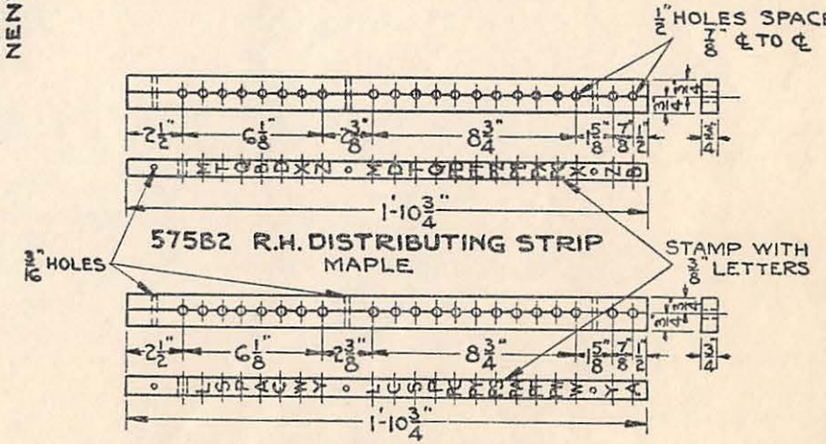

COVER WITH #28 GA. GALV. SHEET IRON 2" DOWN FRONT & SIDES AND 3" DOWN BACK.
1"X#12 R.H. BLUED WOOD SCREWS.
2¼"X#10 F.H. WOOD SCREWS
2"X#12 F.H. WOOD SCREWS
1¼"X#12 F.H. WOOD SCREWS
1"X#6 F.H. WOOD SCREWS
575B3
575B2
575C8
575C1
A
B
1'-0"
¼"X2¾" CARRIAGE BOLTS & HEX. NUT WITH 2-¼" W.I. WASHERS AND ⅞" LENGTH OF ¼" PIPE.
PLATE STAPLES WITH ⅛" IRON CHAIN 1'-7" LONG.
⅝" BORE
COUNTERBORE 1¼" DIA. X ⅜" DEEP
CUT END OF BOLT FLUSH WITH NUT
BACK TO BE FASTENED WITH SCREWS
DISTRIBUTING STRIPS SPLIT & BACK HALF FASTENED PERMANENTLY.
¼"X2¾"X2'-6" STOP
575C2
1'-7½"

575B1 BOX COMPLETE
(WHITE PINE)

SECTION "B-B"



SECTION "A-A"



575B2 R.H. DISTRIBUTING STRIP
MAPLE

575B3 L.H. DISTRIBUTING STRIP
MAPLE

SCALES: 1 IN. & 1½ IN. = 1 FT.

NOTE:
BOX SHALL BE CONSTRUCTED OF THOROUGHLY SEASONED WHITE PINE.
INSIDE SHALL BE PAINTED 2 COATS OF WHITE LEAD AND OIL. THE PRIMING COAT SHALL BE APPLIED BEFORE ASSEMBLING. OUTSIDE SHALL BE PAINTED 1 COAT OF FORMULA "P" PAINT AND FINISHING COAT OF FORMULA "F"
ALL JOINTS SHALL BE LAID IN WHITE LEAD.
DISTRIBUTING STRIPS SHALL BE GIVEN 2 COATS OF VARNISH.

JCO 2.68

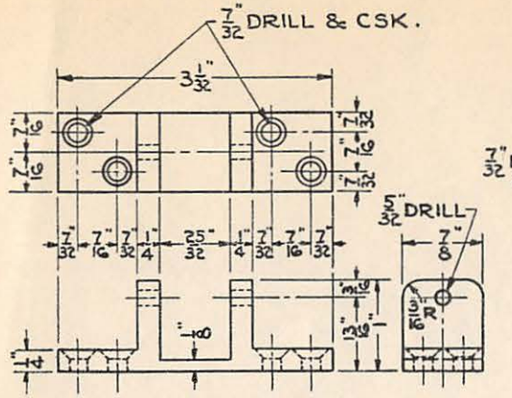
N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

RELAY BOX
4 WAY

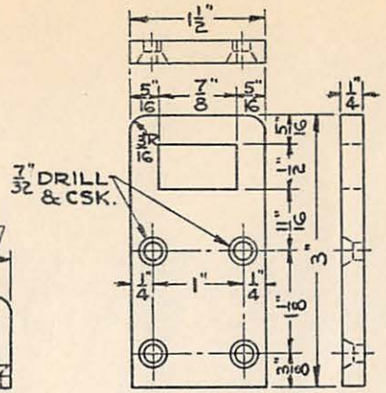
MAY 1, 1920.

REVISION NO. 15	APRIL 29, 1930.	S-A575B

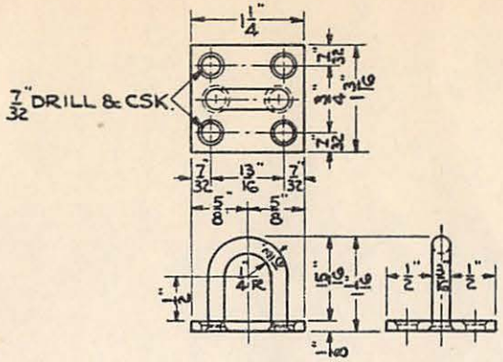
SIGNAL ENGINEER



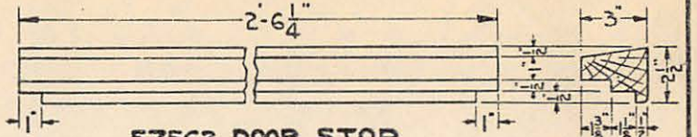
575C5 BRACKET
WROUGHT IRON
(1 REQ.)



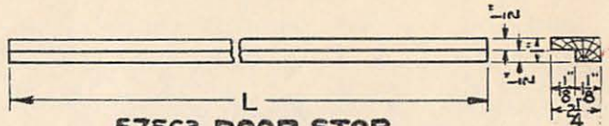
575C6 BRACKET
WROUGHT IRON
(1 REQ.)



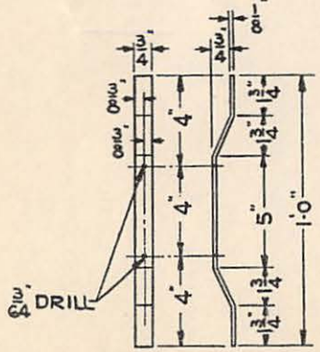
575C7 STAPLE
WROUGHT IRON
(1 REQ.)



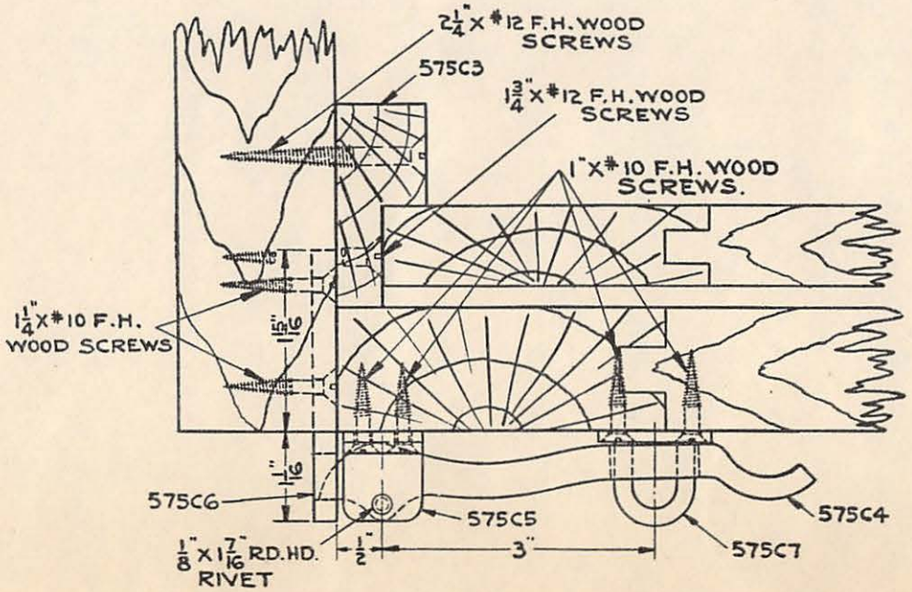
575C2 DOOR STOP
(1 REQ.)



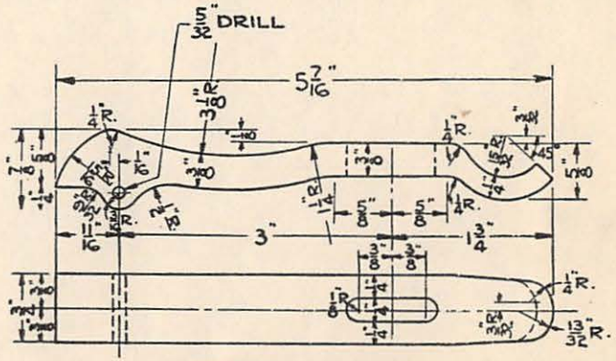
575C3 DOOR STOP
2 REQ. FOR 575A1 BOX. L = 4'-10 3/8"
2 REQ. FOR 575B1 BOX. L = 3'-11"



575C1 SPRING
SPRING BRASS
(2 REQ.)



575C8 LATCH COMPLETE



575C4 LATCH
MALLEABLE IRON
(1 REQ.)

SCALES: 6 IN. & 1½ IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

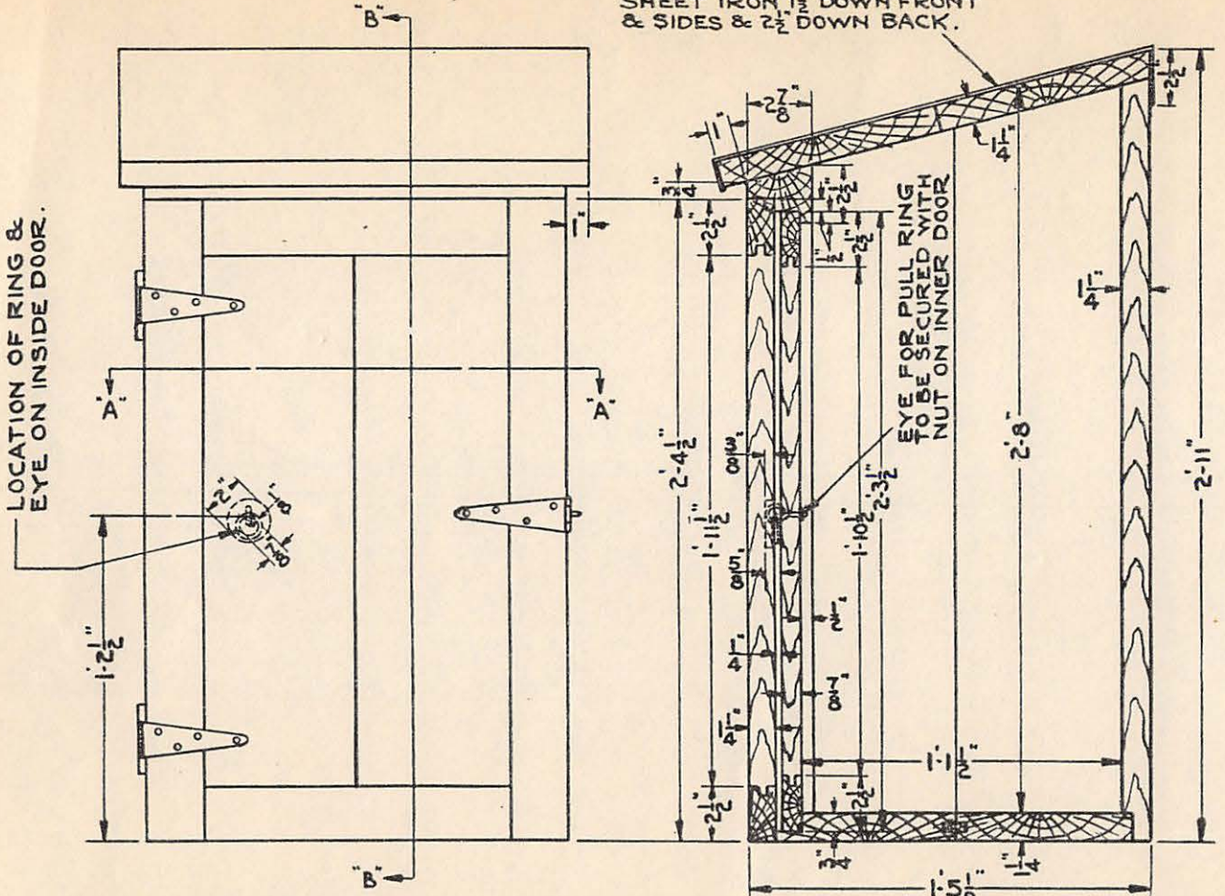
RELAY BOX
DETAILS

FEB. 17, 1930.

REVISION NO. 1	APRIL 29, 1930.	S-A575C

SIGNAL ENGINEER

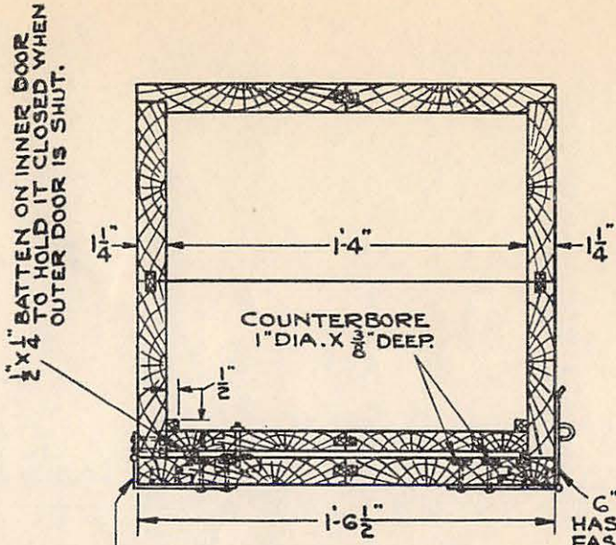
JCO 269



575D1 BOX COMPLETE
WHITE PINE

COVER WITH #28 GA. GALV. SHEET IRON 1½" DOWN FRONT & SIDES & 2½" DOWN BACK.
EYE FOR PULL RING TO BE SECURED WITH NUT ON INNER DOOR
2'-4½"
2'-8"
2'-11"
1'-5⅛"

SECTION "B-B"


½"X¼" BATTEN ON INNER DOOR TO HOLD IT CLOSED WHEN OUTER DOOR IS SHUT.
1'-4"
COUNTERBORE 1" DIA. X ⅜" DEEP.
1'-6½"
6" GALV. IRON HINGED HASP & PLATE STAPLE FASTENED WITH TWO ¼"X1⅜" CARRIAGE BOLTS & SQ. NUTS WITH TWO ¼" W.I. WASHERS & SIX 1¼"X#8 F.H. WOOD SCREWS.
6" HEAVY GALV. IRON TEE HINGES FASTENED WITH FOUR ¼"X1⅜" CARRIAGE BOLTS & SQ. NUTS WITH FOUR ¼" W.I. WASHERS & FOUR 1¼"X#8 F.H. WOOD SCREWS.

SECTION "A-A"

NOTE:
BOX SHALL BE CONSTRUCTED OF THOUROUGHLY SEASONED WHITE PINE. INSIDE SHALL BE PAINTED 2 COATS OF WHITE LEAD AND OIL. THE PRIMING COAT SHALL BE APPLIED BEFORE ASSEMBLING. OUTSIDE SHALL BE PAINTED 1 COAT OF FORMULA "P" PAINT & FINISHING COAT OF FORMULA "F." ALL JOINTS SHALL BE LAID IN WHITE LEAD.

JCO 270

SCALE: 1½ IN. = 1FT.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.
TERMINAL BOX		
AUG. 16, 1904.		
REVISION NO. 8	APRIL 29, 1930.	S-A575D

SIGNAL ENGINEER

NO.	DESIGNATION
BL—	POSITIVE ENERGY WIRE 10V. (AUTOMATIC TERRITORY)
BL1—	" " " " SIGNAL, MOTOR & SLOT (MECH. INT.) OR 670Ω RELAYS EAST (POWER INT.)
BL2—	POSITIVE ENERGY WIRE 10V. 670Ω RELAYS WEST (INT.)
BL3—	" " " " " " EAST "
BL4—	" " " " " " WEST "
BL5—	" " " " SIGNAL INDICATION MAGNETS (INT.)
BL6—	" " " " ELECTRIC LOCKS (INT.)
BL7—	" " " " BELLS EAST (INT.)
BL8—	" " " " " WEST "
BL9—	" " " " LINE EAST FROM (INT.)
BL10—	" " " " " WEST " "
BH—	" " " 110V. POWER INT.
CL—	NEGATIVE " " 10V. (AUTOMATIC TERRITORY)
CL1—	" " " " TO LINE EAST FROM LOCK BATTERY.
CL2—	" " " " " " WEST " " "
CL3—	" " " " TOWER EAST " " "
CL4—	" " " " " WEST " " "
CLE—	" " " " FROM W.B. AUTOMATIC SIGNAL BATTERY TO INT.
CLW—	" " " " " E.B. " " " " " "
CH—	" " " " POWER INT.
CHG—	POSITIVE " " D.C. POWER LINE.
NCHG—	NEGATIVE " " " " "
—A.C.P.—	SERVICE " " TO DISTRIBUTION PANEL.
—A.C.N.—	" " " " " "
BX—	" " " " INDICATION LIGHTS.
NX—	" " " " " " "
WF—	MOTOR FIELD CONNECTING WIRE FOR LOW VOLTAGE SWITCH MACHINE.
NWR—	NORMAL CONTROL RELAY " " " " " "
RWR—	REVERSE " " " " " " " "
W—	SWITCH " " " " " " " "
WK—	MOTOR FIELD INDICATOR " " " " " "
NW—	NORMAL CONTROL WIRE FOR SWITCH MOTOR.
RW—	REVERSE " " " " "
WN—	NEGATIVE ENERGY CONTROL WIRE FOR SWITCH MOTOR.
NWK—	NORMAL INDICATION WIRE FOR SWITCH MECHANISM.
RWK—	REVERSE " " " " "
X—	APPROACH INDICATOR BELL WIRE FROM BACK POINT ON APPROACH RELAY TO BELL OR CROSSING BELL CONTROL WIRE. (PREFIX ABBREVIATION FOR NAME OF STREET.)
FX—	BELL WIRE BETWEEN BLOCK STATIONS.
KT—	BELL AND TELEPHONE WIRE BETWEEN OUTLYING SWITCH AND TOWER.
H—	SELECTING WIRE FOR SLOW SPEED SIGNALS.
HR—	HOME SIGNAL RELAY CONTROL.
DR—	DISTANT " " "
GK—	SIGNAL INDICATION WIRE.
NHY—	RETURN WIRE FROM SIGNAL MOTOR TO NEGATIVE ENERGY.
HY—	SLOT CONTROL WIRE FOR HOME SIGNAL.
DY—	" " " " DISTANT "
HG—	MOTOR " " " HOME "
TB—	WIRE FROM POSITIVE SIDE OF BATTERY TO RAIL.
TN—	" " NEGATIVE " " " " "
TRB—	" " POSITIVE RAIL TO TRACK RELAY.
TRN—	" " NEGATIVE " " " "
WPB—	" " "M" TERMINAL OF SWITCH REPEATING RELAY TO SWITCH CIRCUIT CONTROLLER.
WPN—	" " "L" " " " " " " " "
WR—	" " "M" " " FOULING CIRCUIT " " " " "
WNR—	" " "L" " " " " " " " "
WTB—	" " POSITIVE SIDE OF FOULING CIRCUIT BATTERY TO RAIL.
WTN—	" " NEGATIVE " " " " " " "

NO.	DESIGNATION
WB—	WIRE FROM POSITIVE RAIL TO SWITCH CIRCUIT CONTROLLER.
WN—	" " NEGATIVE " " " " " "
HP—	CONTROL WIRE FROM HOME SIGNAL REPEATER RELAY.
DP—	" " " DISTANT " " " "
TP—	" " " TRACK REPEATER RELAY
S—	" " FOR STICK RELAY.
AK—	APPROACH INDICATOR WIRE
TK—	TRACK " "
HK—	HOME SIGNAL INDICATOR WIRE.
DK—	DISTANT " " "
L—	CONTROL WIRE FOR NORMAL AND REVERSE ELECTRIC LOCK.
LR—	" " " LOCK RELAY AT POWER INTERLOCKING.
NL—	" " " NORMAL ELECTRIC LOCK
RL—	" " " REVERSE " "
M—	" " " HALF REVERSE ELECTRIC LOCK.
WLK—	" " " ELECTRIC SWITCH LOCK.
WLT—	" " " LOCK OR INDICATION MAGNET GOVERNING MOVEMENT OF TOWER INSTRUMENT OR INTERLOCKED LEVER OPERATING ELECTRIC SWITCH LOCK.
FLR—	CONTROL WIRE FOR CHECK LOCK RELAY.
V—	" " " TRAIN STOP INDUCTOR.
NV—	" " " " "
AR—	" " " APPROACH RELAY.
AHR—	" " " " LIGHTING RELAY.
GE—	ENERGY " " GREEN INDICATION COLOR LIGHT SIGNAL.
YE—	" " " YELLOW " " " "
RE—	" " " RED " " " "
ME—	" " " MARKER " " " "
EN—	RETURN " " COLOR LIGHT SIGNAL.

N Y C R. R. WEST OF BUFFALO. | SIGNAL DEPT. | CLEVELAND, O.

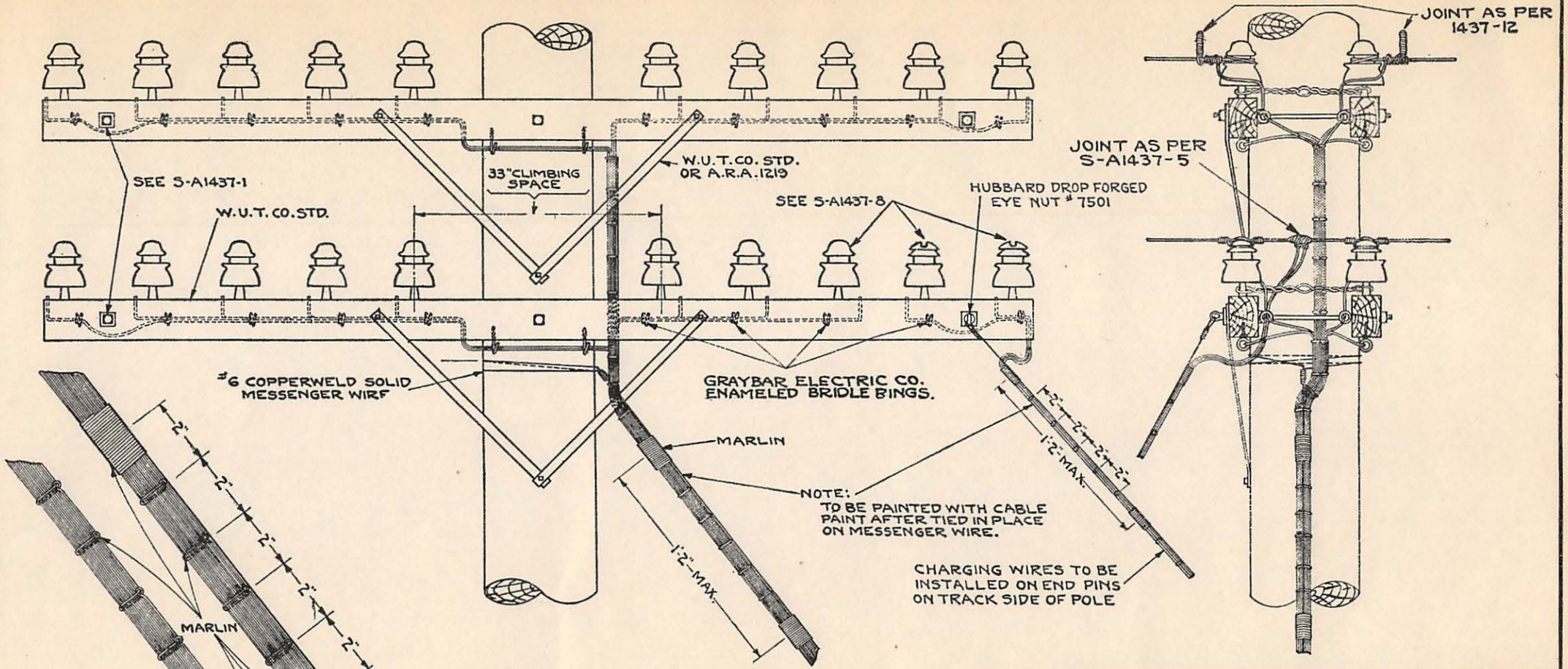
DESIGNATION OF WIRE NUMBERS

MARCH 24, 1921.

REVISION NO. 1 | JUNE 19, 1930. | S-A800A

SIGNAL ENGINEER.

JCO 339


SEE S-A1437-1
W.U.T.CO.STD.
33"CLIMBING SPACE
W.U.T.CO. STD. OR A.R.A.1219
SEE S-A1437-8
HUBBARD DROP FORGED EYE NUT # 7501
JOINT AS PER 1437-12
JOINT AS PER S-A1437-5
#6 COPPERWELD SOLID MESSENGER WIRE
GRAYBAR ELECTRIC CO. ENAMELED BRIDLE RINGS.
MARLIN
1'-2"-MAX.
NOTE: TO BE PAINTED WITH CABLE PAINT AFTER TIED IN PLACE ON MESSENGER WIRE.
CHARGING WIRES TO BE INSTALLED ON END PINS ON TRACK SIDE OF POLE
2'-2'-2'-2'-2'-2'
MARLIN
#12 S.D.R.C. WIRES TO BE THOROUGHLY CABLE TIED TOGETHER WITH MARLIN BEFORE BEING TIED TO MESSENGER WIRE.
1182-31
MARLIN
MARLIN
MESSENGER CONNECTION TO EYE BOLTS ON JUNCTION POST.

JCO 101

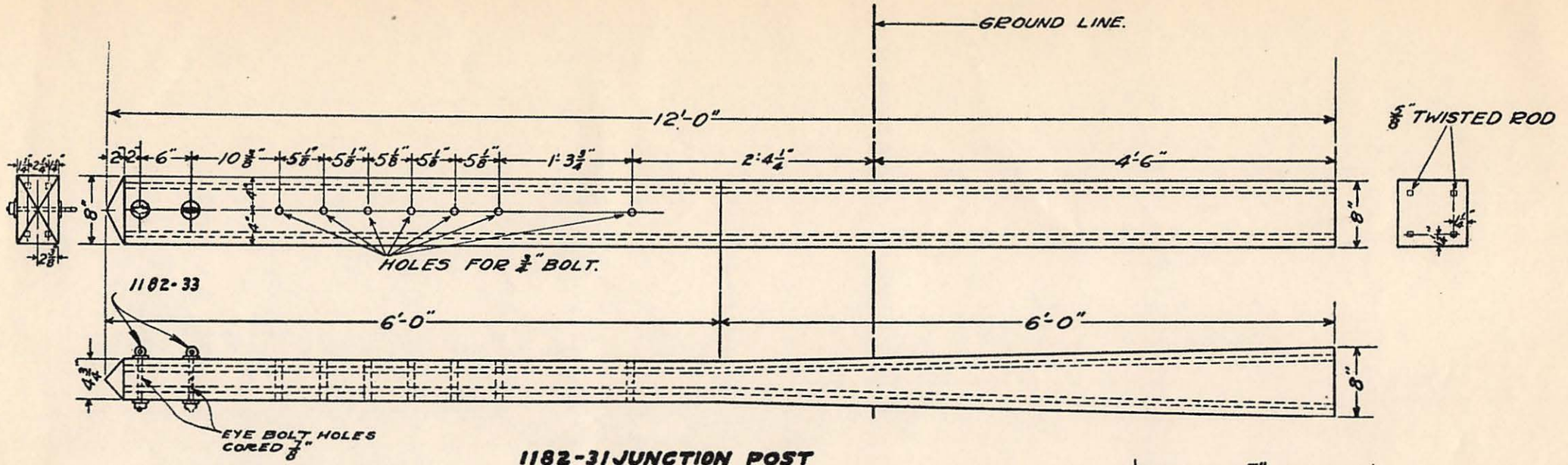
N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

LINE CONNECTIONS

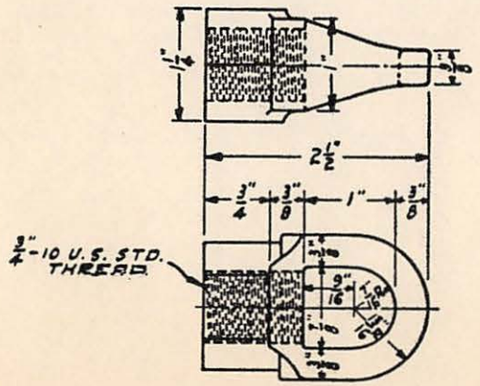
AUG. 19, 1911.

REVISION NO. 13	SEPT. 30, 1929.	S-A1169

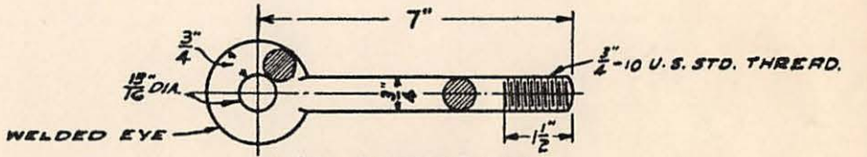
SIGNAL ENGINEER.



1182-31 JUNCTION POST



1182-32 EYE NUT
GALV.



1182-33 EYE BOLT
GALV.

TO BE FURNISHED WITH 2-¾" GALV. WASHERS AND STD. GALV. HEX. NUT OR EYE NUT 1182-32 AS SPECIFIED.

SCALE: 6 IN. = 1 FT. 3 IN. = 1 FT. ¾ IN. = 1 FT.

N.Y.C.R.R. WEST OF BUFFALO.	SIGNAL DEP'T.	CLEVELAND, O.

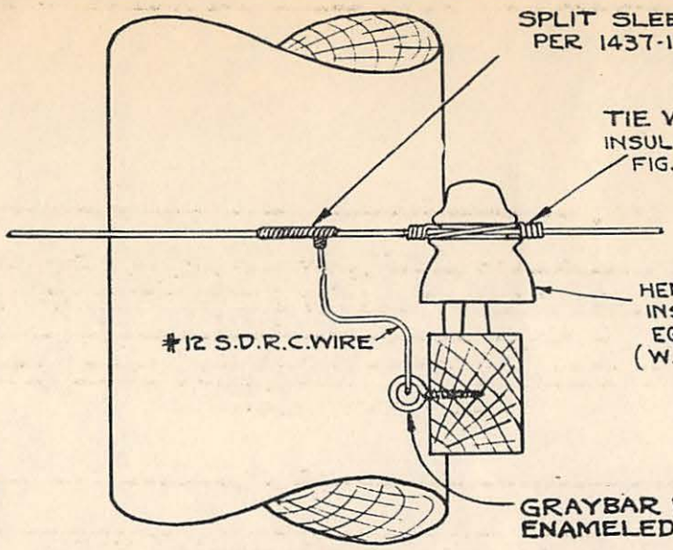
JUNCTION. POST.

CONCRETE.
NOV. 24, 1916.

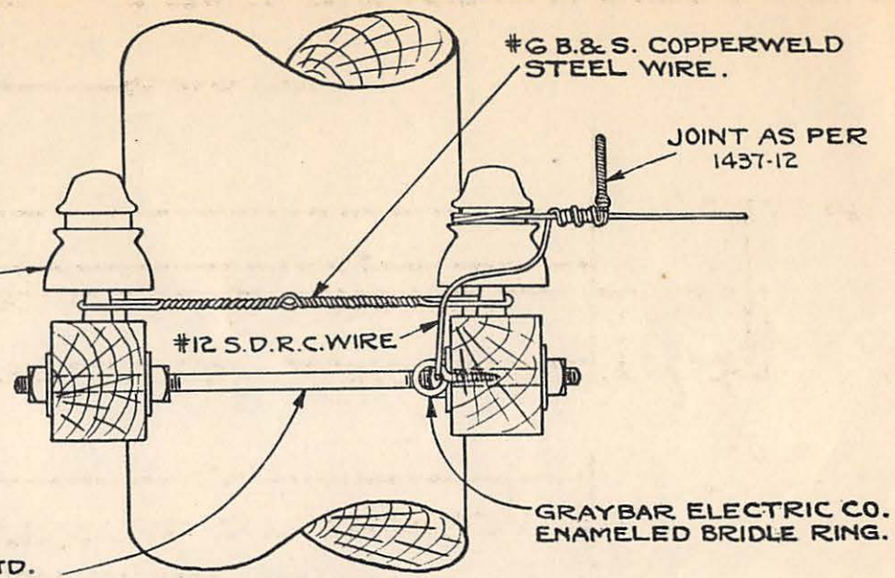
REVISION No 3	JUNE 23, 1925	S-A1182-3

SIGNAL ENGINEER

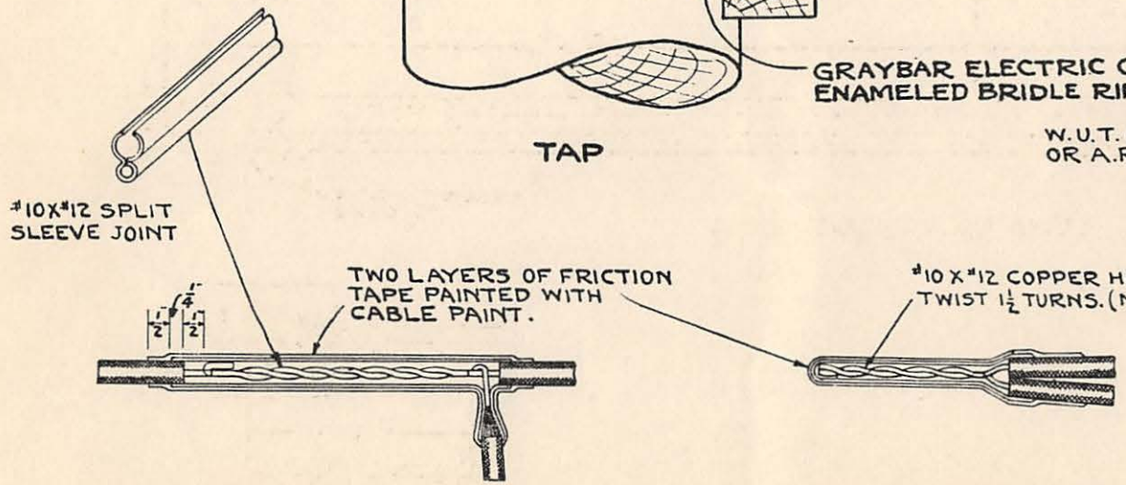
DCO 227


SPLIT SLEEVE AS PER 1437-11
TIE WIRE, PIN AND INSULATOR AS PER. FIG.(2) S-A1437-8.
HEMINGRAY #42 INSULATOR OR EQUIVALENT (W.U.T. CO. STD.)
#12 S.D.R.C.WIRE
GRAYBAR ELECTRIC CO. ENAMELED BRIDLE RING.

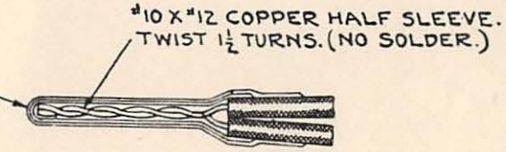
TAP


#6 B.& S. COPPERWELD STEEL WIRE.
JOINT AS PER 1437-12
#12 S.D.R.C.WIRE
GRAYBAR ELECTRIC CO. ENAMELED BRIDLE RING.
W.U.T. CO. STD. OR A.RA. 1220.

DEAD ENDING



1437-11 BRANCH CONNECTION



1437-12 DEAD END CONNECTION

NOTE:
WIRE AND SLEEVE MUST BE CLEANED BEFORE MAKING UP.

NOTE:
POSITION OF FINISHED JOINT SHALL BE UPRIGHT.
WIRE AND SLEEVE MUST BE CLEANED BEFORE MAKING UP.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

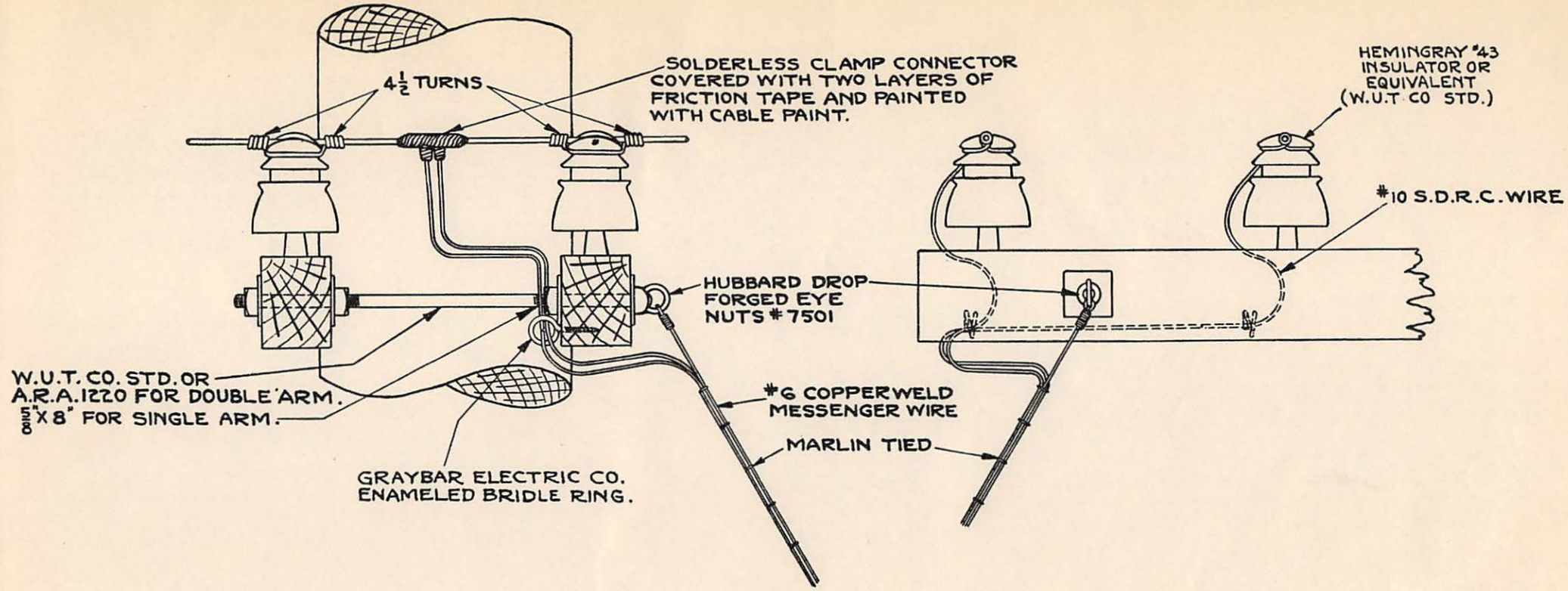
BRANCH CONNECTIONS

FEB. 15, 1918.

REVISION NO. 4	SEPT. 30, 1929.	S-A1437-1

SIGNAL ENGINEER

JCO 103


4½ TURNS
SOLDERLESS CLAMP CONNECTOR COVERED WITH TWO LAYERS OF FRICTION TAPE AND PAINTED WITH CABLE PAINT.
HEMINGRAY #43 INSULATOR OR EQUIVALENT (W.U.T CO STD.)
#10 S.D.R.C. WIRE
HUBBARD DROP FORGED EYE NUTS #7501
W.U.T. CO. STD. OR A.R.A. 1220 FOR DOUBLE ARM.
5/8" X 8" FOR SINGLE ARM.
#6 COPPERWELD MESSENGER WIRE
MARLIN TIED
GRAYBAR ELECTRIC CO. ENAMELED BRIDLE RING.

NOTE:

POWER WIRES TO BE INSTALLED ON TRACK SIDE OF POLE, END PINS, BOTTOM POSITION.

WHERE POWER WIRES ARE LOCATED ON SEPARATE TOP POSITION, DOUBLE ARMS ARE NOT REQUIRED.

USE #10 S.D.R.C. WIRE FOR ALL DROPS OTHER THAN AT MAIN FEED LOCATION.

UNLESS REQUIRED FOR OTHER PURPOSES SUCH AS DEAD ENDING OF WIRES, DOUBLE ARMS ARE NOT REQUIRED AT POWER LINE CONNECTION LOCATIONS

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

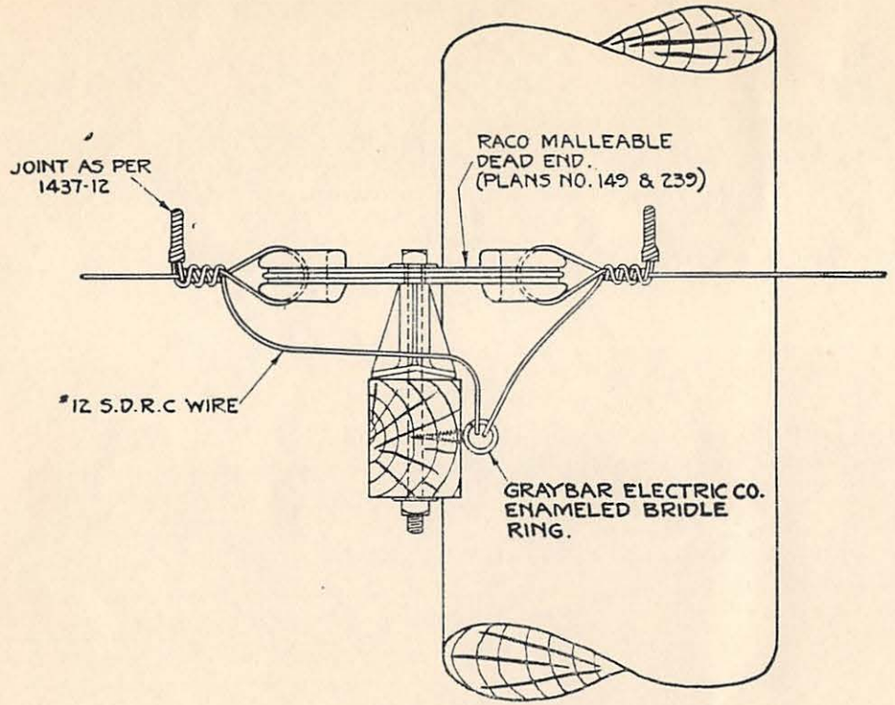
POWER LINE CONNECTION AND DOUBLE ARMING

MARCH 29, 1924.

REVISION NO. 4	FEB. 14, 1930	S-A1437-5

SIGNAL ENGINEER

JCO 104



FOR DOUBLE DEAD ENDING ON
SINGLE ARM

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT	CLEVELAND, O

BRANCH CONNECTIONS

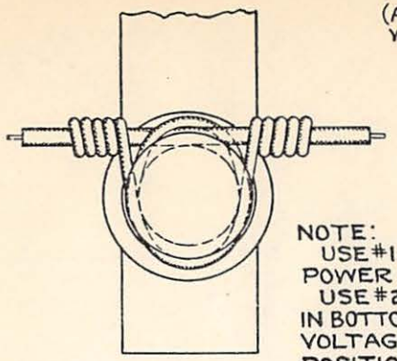
SIGNAL BREAK ARM

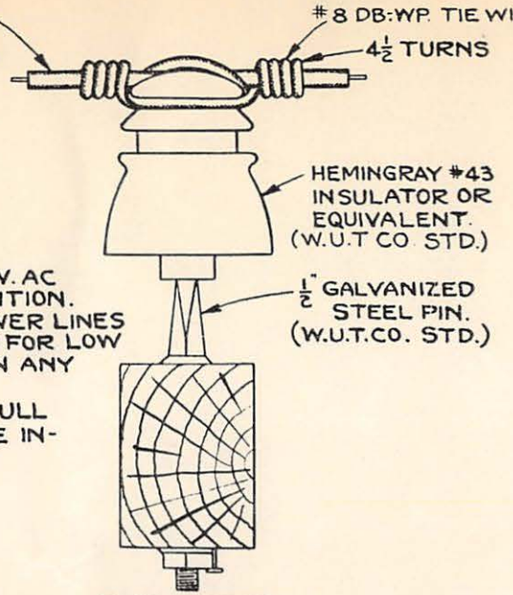
JUNE 12, 1925.

REVISION NO 4.	OCT. 28, 1929.	S-A1437-6

SIGNAL ENGINEER

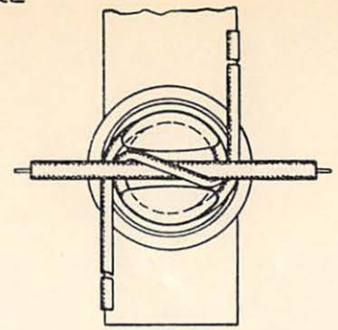
JCO159



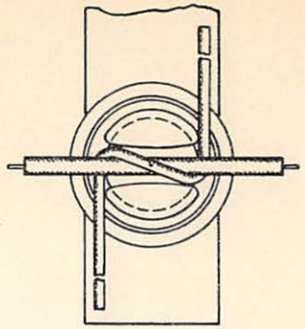

#4 DB.-WP. LINE WIRE (ALSO OTHER SIZES WHERE SPECIFIED.)
#8 DB:WP. TIE WIRE
4½ TURNS
HEMINGRAY #43 INSULATOR OR EQUIVALENT. (W.U.T CO STD.)
½" GALVANIZED STEEL PIN. (W.U.T.CO. STD.)

NOTE:
USE #1 FOR 440V. TO 4400V. AC POWER LINES IN TOP POSITION.
USE #2 FOR 440 V. AC POWER LINES IN BOTTOM POSITION. ALSO FOR LOW VOLTAGE SIGNAL WIRES IN ANY POSITION.
WHEN A HEAVY DOWN PULL OCCURS USE TOP GROOVE INSULATOR AS IN #1.

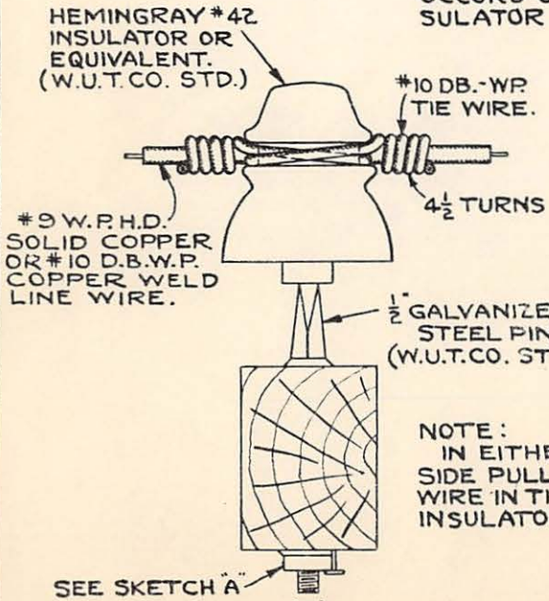
FINAL STEP
(1)



SECOND STEP
(1)

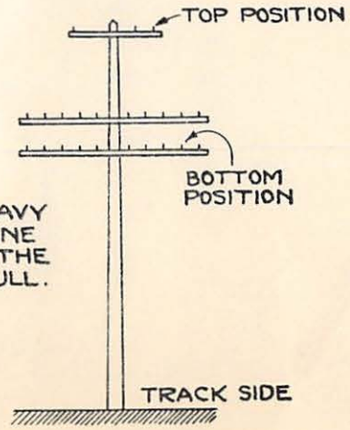


FIRST STEP
(1)

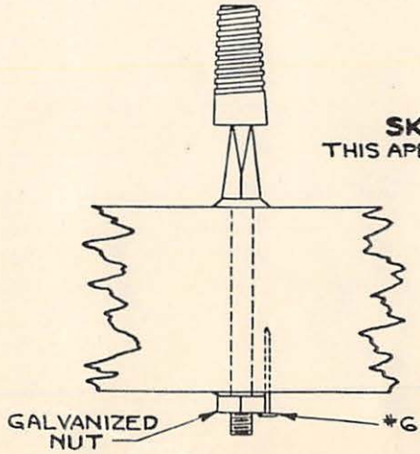

HEMINGRAY #42 INSULATOR OR EQUIVALENT. (W.U.T.CO. STD.)
#10 DB.-WP. TIE WIRE.
4½ TURNS
#9 W.P.H.D. SOLID COPPER OR #10 D.B.W.P. COPPER WELD LINE WIRE.
½" GALVANIZED STEEL PIN. (W.U.T.CO. STD.)
SEE SKETCH "A"

(2)

NOTE:
IN EITHER #1 OR #2 IF A HEAVY SIDE PULL OCCURS, PLACE LINE WIRE IN THE SIDE GROOVE OF THE INSULATOR OPPOSITE THE PULL.



SKETCH "A"
THIS APPLIES TO BOTH #1 & #2



SCALE: 3 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

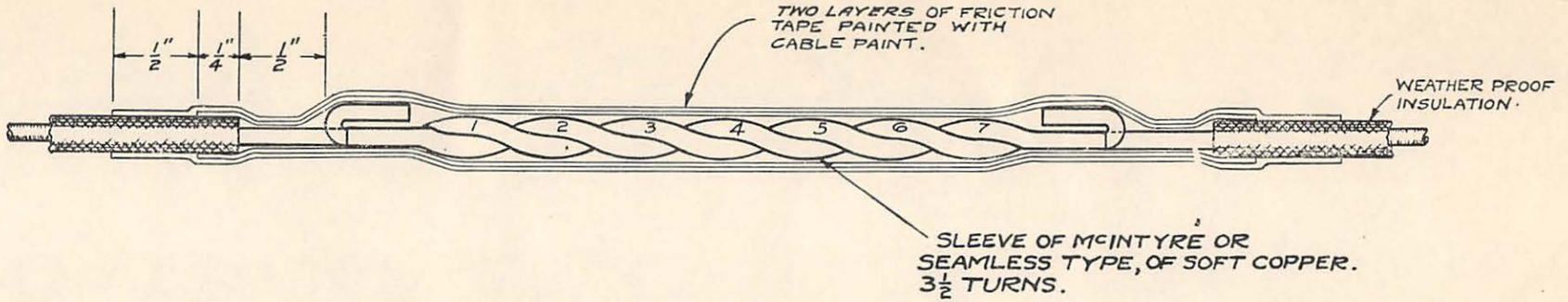
LINE WIRE TIES
INSULATORS AND PINS

AUG. 25, 1927.

REVISION NO. 3	MAY 26, 1930.	S-A1437-8

SIGNAL ENGINEER

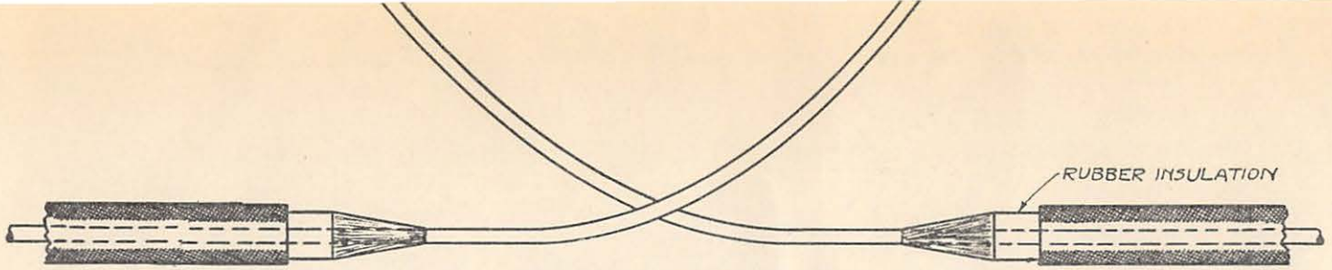
JCG 197



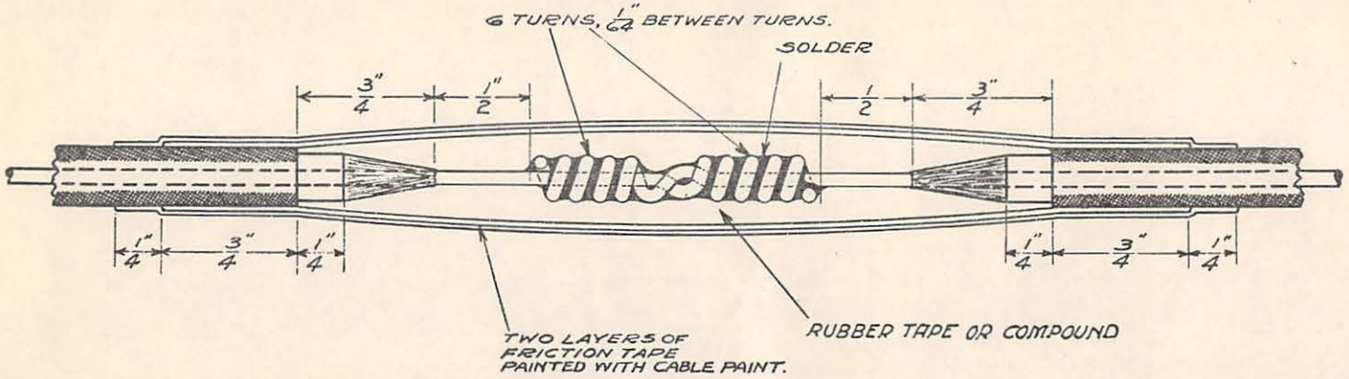
FINISHED

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.
LINE WIRE JOINTS FEB. 15, 1918.		
REVISION NO. 3	DEC. 11, 1928.	S-A1438
		SIGNAL ENG'R.

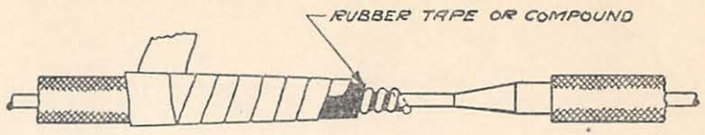
JCO 108



FIRST. POSITION.



FINISHED JOINT



FIRST POSITION

FINISHED POSITION

NOTE:

JOINTS IN NEW INSTALLATIONS SHALL NOT BE ALLOWED. IN RENEWALS OR ADDITIONS THEY MAY BE MADE IF ESPECIALLY ALLOWED IN EACH CASE BY ENGINEER. CONDUCTORS SHALL BE THOROUGHLY CLEANED BUT TINNING OF WIRE MUST NOT BE DESTROYED. SOLDER TO BE POURED OVER JOINT, OR JOINT DIPPED IN SOLDER UNTIL THE WIRE IS SAME TEMPERATURE AS SOLDER.

N.Y.C.R.R. WEST OF BUFFALO.	SIGNAL DEPARTMENT.	CLEVELAND, O.

RUBBER INSULATED WIRE JOINT

FEB. 15, 1918.

REVISION NO. 1	JULY 28, 1928.	S-A1440

Fading

SIGNAL ENGINEER.

JCO 109

GAUGE (B&S) OF COPPER OPERATING AND RETURN WIRES FOR UNITS

ITEM NUMBER	NUMBER OF COND.	UNITS	DISTANCE BETWEEN INTERLOCKING MACHINE AND UNIT								
			NO.14	NO.12	NO.10	NO.8	NO.6	NO.4	NO.2	NO.0	NO.00
1	3	DWARF SIGNAL SOLENOID 110 V. MODEL 2	1500	2470	3920	6250	9750	15330			
2	2	SIGNAL 2 POS. 2A-110 V. NON FREE RUN MOTOR	5800	9260	14700	23650	36600	57700			
3	2	" 3 " " " " " " "	5800	9260	14700	23650	36600	57700			
4	3	" 2 POS. 2A-110 V. FREE RUN MOTOR	5800	9260	14700	23650	36600	57700			
5	4	" 3 " " " " " "	5800	9260	14700	23650	36600	57700			
6	3	SINGLE SWITCH OR DERAIL MODEL 2 110 V.	795	1260	2000	3170	5130	8000			
7	3	" " " " " 4A "	795	1260	2000	3170	5130	8000			
8	3	" " " " " 5A " (3 SECONDS)	795	1260	2000	3170	5130	8000			
9	3	" " " " " 5A MEDIUM SPEED 110 V. (7 SECONDS)	1665	2650	4215	6710	10650	16940			
10	3	" " " " " 5A LOW SPEED 110 V. (14 SECONDS)	7540	11900	19000	30100	48700	76000			
11	3	ONE END DOUBLE SLIP SW. OR M.P. FROG MODEL 2 110 V.	555	880	1400	2220	3590	5600			
12	3	" " " " " " " " " " " 4A "	555	880	1400	2220	3590	5600			
13	3	" " " " " " " " " " " 5A "	555	880	1400	2220	3590	5600			
14											
15											
16	2	110 V. BATTERY					100	160	255	400	640
17											
18											

NOTE:

(1) DISTANCES IN TABLE REPRESENT DISTANCE ALONG CONDUCTOR FROM INTERLOCKING MACHINE BUS BAR TO UNIT.
(2) DISTANCES CROSS HATCHED ARE GIVEN AS INFORMATION ONLY AND WIRE SIZES FOR SUCH DISTANCES ARE NOT TO BE USED EXCEPT BY SPECIAL AUTHORITY.
(3) SHOULD INCREASED LOAD ON FROGS AND SWITCHES OR INCREASED DISTANCES OCCUR ON ANY UNIT, INCREASE THE NUMBER OF CELLS OF MAIN BATTERY TO COMPENSATE RATHER THAN CHANGE OUT WIRE TO LARGER SIZE.
(4) FOR OPEN LINE CONSTRUCTION H.D.W.P. SOLID COPPER WILL BE USED AND GAUGE SHALL NOT BE SMALLER THAN NO. 10.

JCO 255

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

WIRE SIZES

ELECTRIC INTERLOCKING
(USING 56 CELLS LEAD BATTERY)
OCT. 31, 1928.

REVISION NO. 2	SEPT. 20, 1929.	S-A1487-1

SIGNAL ENGINEER

NOTE:

(1) LOW VOLTAGE OPEN LINE WIRE COMMON, OUTSIDE OF INTERLOCKING LIMITS, SHALL BE # 9 W.P. H.D. SOLID COPPER. OTHER LOW VOLTAGE OPEN LINE WIRES, OUTSIDE OF INTERLOCKING LIMITS, SHALL BE # 10 D.B.W.P. 30% COPPER WELD.
LOW VOLTAGE COMMON IN AERIAL CABLE, SHALL BE # 10 S.D. COPPER. OTHER LOW VOLTAGE SIGNAL CONDUCTORS IN AERIAL CABLE, SUCH AS RELAY CONTROLS SHALL BE # 14 S.D. COPPER.

(2) DISTANCES CROSS HATCHED ARE GIVEN AS INFORMATION ONLY AND WIRE SIZES FOR SUCH DISTANCES ARE NOT TO BE USED EXCEPT BY SPECIAL AUTHORITY.

(3) SHOULD SPECIAL OPERATING CONDITIONS OR INCREASED DISTANCES OCCUR ON ITEM # 1 OR # 2, INCREASE THE NUMBER OF CELLS OF OPERATING BATTERY TO COMPENSATE RATHER THAN CHANGE OUT WIRE TO LARGER SIZE.

(4) WIRE SIZES FOR ITEM # 18 WILL BE FURNISHED UNDER SPECIAL INSTRUCTIONS.

(5) WIRE SIZES FOR ITEM # 19 WILL VARY ACCORDING TO TOTAL LOAD REQUIREMENTS FOR A GIVEN COMBINATION OF CIRCUITS.

(6) BATTERY LEADS TO TRACK 1 COND. # 10 SOLID.

(7) RELAY LEADS TO TRACK 1 COND. # 6 SOLID.

(8) 10 VOLT SIGNAL MOTOR CONTROLS 3 COND. # 6 SOLID.

(9) POWER CIRCUIT FEEDING RECTIFIERS BETWEEN HOME SIGNALS AT INTERLOCKING PLANT # 8 COPPER CONDUCTORS.

(10) SWITCH CIRCUIT CONTROLLER SHUNT WIRES ONE SINGLE CONDUCTOR PER RAIL # 6 SOLID.

(11) G.R.S. TRAIN STOP INDUCTOR TWO SINGLE CONDUCTOR # 8 STRAND.

GAUGE (B&S) OF COPPER OPERATING AND RETURN WIRES FOR UNITS

ITEM NUMBER	NUMBER OF COND.	UNITS	DISTANCE BETWEEN ENERGY SUPPLY AND UNIT				
			NO. 14	NO. 12	NO. 10	NO. 8	NO. 6
1	3	SINGLE SW. OR DERAIL MODEL 5-20V. DYNAMIC INDICATION 32.5 V. AT LEVER.	485	800	1250	1950	
2	3	SINGLE SW. OR DERAIL MODEL 5-20 V. NO INDICATION 24V. AT BATTERY. 10 SEC. OPERATION.					150
3	4	3 POS. COLOR LIGHT SIGNAL 8V.-18W. BULB 10V. ENERGY SUPPLY AT BATTERY.	100	160	250	400	650
4	3	2 POS. COLOR LIGHT SIGNAL 8V.-18 W. BULB 10 V. ENERGY SUPPLY AT BATTERY.	100	160	250	400	650
5	2	COLOR LIGHT SIGNAL MARKER 8V.-18W. BULB 10V. ENERGY SUPPLY AT BATTERY.	100	160	250	400	650
6							
7	3	HIGHWAY FLASHING LIGHT SIGNALS 6V.-5W OR 10W. BULB 6V. ENERGY SUPPLY AT BATTERY.	45	60	100	175	300
8	2	HIGHWAY SIGNAL PIER LIGHTS 6V.-5W. BULB. 7V. ENERGY SUPPLY AT SERVICE.	300	550	900		
9	2	HIGHWAY SIGNAL STOP SIGN- SINGLE BULB- 6V.-5W.-7V. ENERGY SUPPLY AT SERVICE.	300	550	900		
10	2	HIGHWAY SIGNAL PIER AND STOP LIGHTS ITEMS 8 AND 9 COMBINED.	185	300	475		
11							
12							
13	2	S.S. RELAY (MOTOR TYPE-250Ω)	2250	3500	5500		
14							
15		RELAY CIRCUIT FED BY 10V. OR 12V. BATTERY.	26400				
16							
17							
18		SIGNAL DISPATCHING RELAY CONTROLS	SEE NOTE (4)				
19		BATTERY (BL AND CL)	" " (5)				
20							
21							

N. Y. C. R. R. WEST OF BUFFALO | SIGNAL DEPT. | CLEVELAND, O.

WIRE SIZES

LOW VOLTAGE CIRCUITS

OCT. 31, 1928.

REVISION NO. 3 | MAY 26, 1930. | S-A1487-2

SIGNAL ENGINEER

JC084

NOTE:

(1) Spare Conductors:

Trunk runs per S-A1487-4 having 5 or more conductors shall be furnished on the basis of having 20% spare when such run has up to 50 conductors and 15% spare when run has up to 100 conductors.
Cables used as laterals shall, as far as practicable, be furnished without spare conductors.

(2) Number and combination of conductors in a cable are dependent upon the necessity of the location with due regard for future developments.

Cables may be built up to include in same cable both low and high voltage (not exceeding 220v) circuits. Where requirements are such as to demand a conductor of large gauge for specific purposes, smaller conductors may be used in multiple to obtain required carrying capacity. This is of particular value in making changes.

The following tables indicate the number and gauge of conductors that will be contained in cables having a maximum outside diameter of 2½". These combinations of gauge sizes may be varied to suit requirements providing outside diameter of cables does not exceed 2½". Cables having outside diameter larger than 2½" should not be placed except under special authority.

Ga. (B. & S.) of Conductor	No. of Conductors in Parkway Cable	No. of Conductors in Lead Encased Cable
6	21	24
8	27	31
10	40	49
12	49	61
14	54	70

(3) Where conductors are of the same size in any given cable the following groups of conductors will lay up into round cores and thus make standard cables:

3 - 4 - 7 - 12 - 14 - 19 - 27 -

30 - 37 - 48 - 52 - 61 - 75 - 80 - 91

Where possible, preference should be given to above groupings.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.
CABLE CONDUCTOR REQUIREMENTS		
OCT. 31, 1928.		
REVISION NO. 1	JUNE 21, 1929.	S-A1487-3

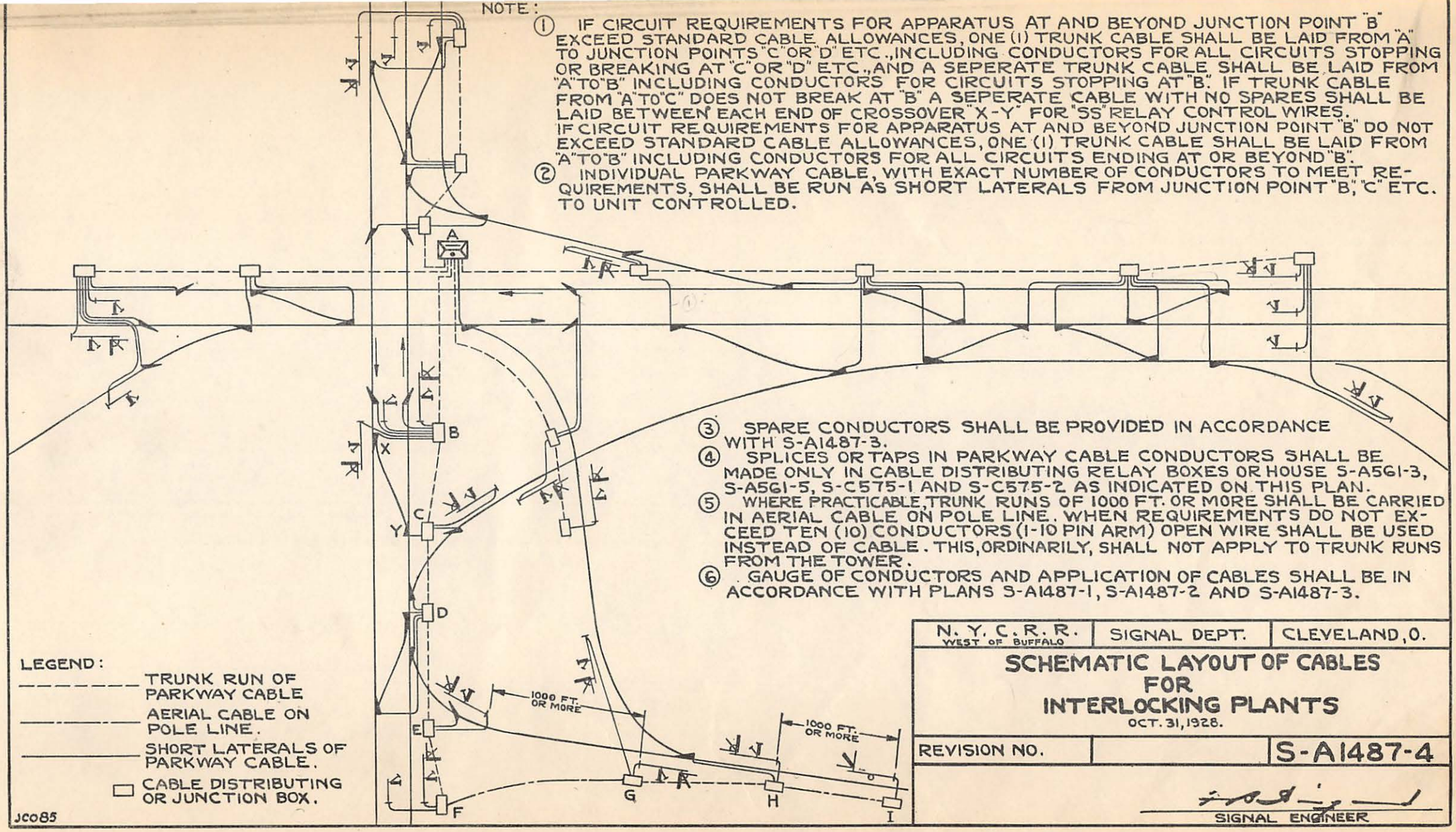
SIGNAL ENGINEER.

JCO 1-A

NOTE:

① IF CIRCUIT REQUIREMENTS FOR APPARATUS AT AND BEYOND JUNCTION POINT "B" EXCEED STANDARD CABLE ALLOWANCES, ONE (1) TRUNK CABLE SHALL BE LAID FROM "A" TO JUNCTION POINTS "C" OR "D" ETC., INCLUDING CONDUCTORS FOR ALL CIRCUITS STOPPING OR BREAKING AT "C" OR "D" ETC., AND A SEPERATE TRUNK CABLE SHALL BE LAID FROM "A" TO "B" INCLUDING CONDUCTORS FOR CIRCUITS STOPPING AT "B". IF TRUNK CABLE FROM "A" TO "C" DOES NOT BREAK AT "B" A SEPERATE CABLE WITH NO SPARES SHALL BE LAID BETWEEN EACH END OF CROSSOVER "X-Y" FOR "SS" RELAY CONTROL WIRES. IF CIRCUIT REQUIREMENTS FOR APPARATUS AT AND BEYOND JUNCTION POINT "B" DO NOT EXCEED STANDARD CABLE ALLOWANCES, ONE (1) TRUNK CABLE SHALL BE LAID FROM "A" TO "B" INCLUDING CONDUCTORS FOR ALL CIRCUITS ENDING AT OR BEYOND "B".

② INDIVIDUAL PARKWAY CABLE, WITH EXACT NUMBER OF CONDUCTORS TO MEET REQUIREMENTS, SHALL BE RUN AS SHORT LATERALS FROM JUNCTION POINT "B", "C" ETC. TO UNIT CONTROLLED.



③ SPARE CONDUCTORS SHALL BE PROVIDED IN ACCORDANCE WITH S-A1487-3.

④ SPLICES OR TAPS IN PARKWAY CABLE CONDUCTORS SHALL BE MADE ONLY IN CABLE DISTRIBUTING RELAY BOXES OR HOUSE S-A561-3, S-A561-5, S-C575-1 AND S-C575-2 AS INDICATED ON THIS PLAN.

⑤ WHERE PRACTICABLE, TRUNK RUNS OF 1000 FT. OR MORE SHALL BE CARRIED IN AERIAL CABLE ON POLE LINE. WHEN REQUIREMENTS DO NOT EXCEED TEN (10) CONDUCTORS (1-10 PIN ARM) OPEN WIRE SHALL BE USED INSTEAD OF CABLE. THIS, ORDINARILY, SHALL NOT APPLY TO TRUNK RUNS FROM THE TOWER.

⑥ GAUGE OF CONDUCTORS AND APPLICATION OF CABLES SHALL BE IN ACCORDANCE WITH PLANS S-A1487-1, S-A1487-2 AND S-A1487-3.

LEGEND:

- TRUNK RUN OF PARKWAY CABLE
- AERIAL CABLE ON POLE LINE.
- SHORT LATERALS OF PARKWAY CABLE.
- CABLE DISTRIBUTING OR JUNCTION BOX.

JC085

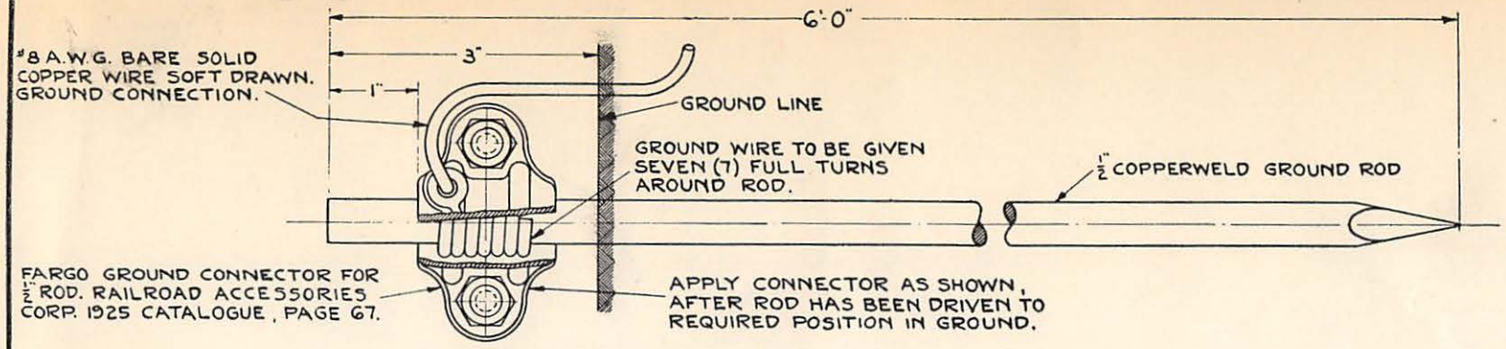
N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

SCHEMATIC LAYOUT OF CABLES FOR INTERLOCKING PLANTS

OCT. 31, 1928.

REVISION NO.		S-A1487-4

SIGNAL ENGINEER


6'-0"
3"
1"
#8 A.W.G. BARE SOLID COPPER WIRE SOFT DRAWN. GROUND CONNECTION.
GROUND LINE
GROUND WIRE TO BE GIVEN SEVEN (7) FULL TURNS AROUND ROD.
½" COPPERWELD GROUND ROD
FARGO GROUND CONNECTOR FOR ½" ROD. RAILROAD ACCESSORIES CORP. 1925 CATALOGUE, PAGE 67.
APPLY CONNECTOR AS SHOWN, AFTER ROD HAS BEEN DRIVEN TO REQUIRED POSITION IN GROUND.

A- LOCATION:

1- GROUND ELEMENTS SHALL BE INSTALLED AT ALL LOCATIONS WHERE LIGHTNING ARRESTERS FOR PROTECTION OF SIGNALING APPARATUS ARE IN USE.

2- GROUND ELEMENTS SHALL BE LOCATED AT BOTTOM OF FILLS.

3- WHEN ARRESTERS ARE PROVIDED FOR HIGH VOLTAGE (200 OR MORE VOLTS) LINES, SEPARATE GROUND ELEMENT SHALL BE USED. IT SHALL BE NOT CLOSER THAN TWELVE (12) FEET TO NEAREST LOW VOLTAGE (200 VOLTS OR LESS) GROUND ELEMENTS.

B- NUMBER USED AND RESISTANCE:

A MAXIMUM GROUND RESISTANCE OF 15 OHMS IS PERMISSIBLE. THIS VALUE MAY BE OBTAINED BY THE USE OF ONE GROUND ELEMENT. IF ONE GROUND ELEMENT DOES NOT MAKE GROUND CONNECTION OF 15 OHMS OR LESS ADDITIONAL GROUND ELEMENTS MUST BE ADDED AND TIED TOGETHER WITH #8 A&W GAGE BARE COPPER WIRE UNTILL 15 OHMS OR LESS IS OBTAINED. ADDITIONAL GROUND ELEMENTS SHALL BE SPACED NOT CLOSER THAN 6 FEET.

C- GROUND LEADS AND CONNECTIONS - GENERAL:-

1- THREE-EIGHTS INCH (3/8") AIR SPACE SHALL BE PROVIDED BETWEEN GROUND LEADS AND SIGNAL CIRCUITS.

2- GROUND LEAD SHALL BE WITHOUT JOINT AND SHALL NOT EXCEED SIXTY (60) FEET IN LENGTH UNLESS PERMITTED BY SIGNAL ENGINEER.

3- GROUND LEAD SHALL BE BURIED IN EARTH THREE (3) INCHES AND RUN AS DIRECTLY AS POSSIBLE FROM GROUND ELEMENT TO BUS CONNECTING ARRESTERS.

D- GROUND LEADS AND CONNECTIONS - LOW VOLTAGE:-

1- ARRESTERS SHALL BE MOUNTED IN RELAY OR JUNCTION BOX OR RELAY HOUSE.

2- ARRESTERS IN EACH HOUSE SHALL BE CONNECTED BY BUS BAR.

3- GROUND LEAD SHALL BE CONNECTED TO GROUND TERMINAL OF ARRESTER NEAREST TO GROUND LEAD ENTRANCE.

4- ARRESTERS IN RELAY OR JUNCTION BOXES SHALL BE CONNECTED TOGETHER INSIDE OF EACH BOX BY BUS BAR. WHERE TWO OR MORE BOXES ARE ADJACENT THE GROUPS OF ARRESTERS SHALL BE CONNECTED TOGETHER AT BACK OR SIDE BY #8 A&W GAGE BARE COPPER WIRE.

E- GROUND LEADS AND CONNECTIONS - HIGH VOLTAGE:-

ARRESTERS WHERE USED FOR HIGH VOLTAGE CIRCUITS SHALL BE MOUNTED ON CROSS ARMS OR AS INSTRUCTED BY SIGNAL ENGINEER AND CONNECTED TO GROUND ELEMENT BY #8 A&W GAGE BARE COPPER WIRE STAPLED TO POLE.

F- SPECIAL GROUNDS:

WHERE ROCK BED IS PREVALENT SO THAT A STANDARD GROUND CANNOT BE DRIVEN, SPECIAL SURFACE GROUNDS SHALL BE USED. EACH CASE SHALL BE HANDLED AS SPECIFIED BY SIGNAL ENGINEER.

SCALE: 1/8 IN. = 1 FT. & 6 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

ARRESTER GROUNDS

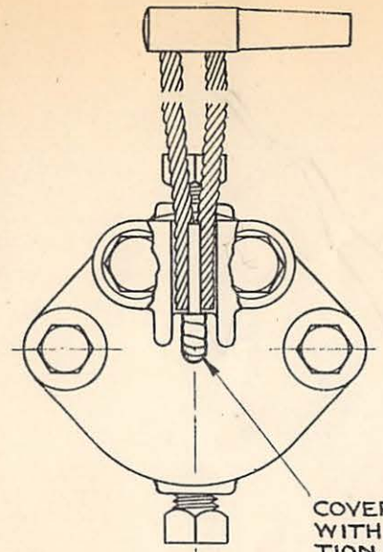
COPPERWELD ROD

JUNE 15, 1920.

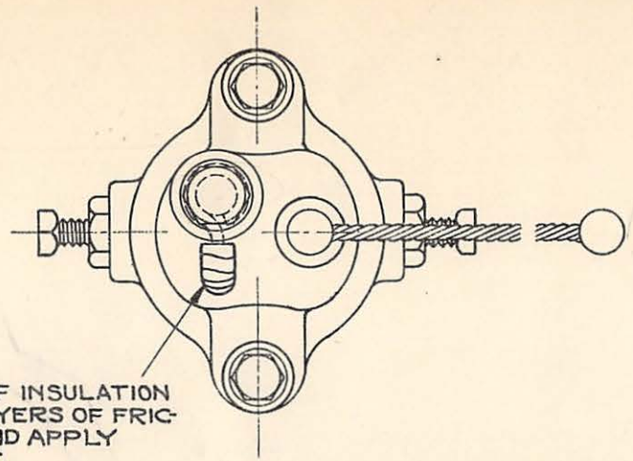
REVISION NO. 2	JAN. 28, 1930.	S-A1588-1

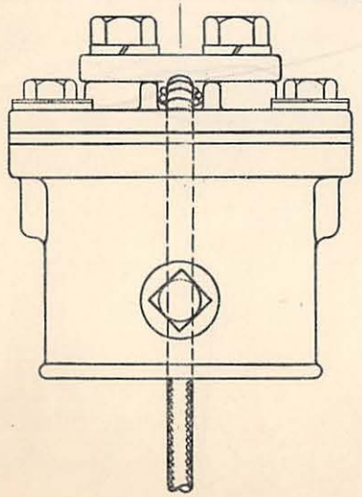
SIGNAL ENGINEER.

JC 0317



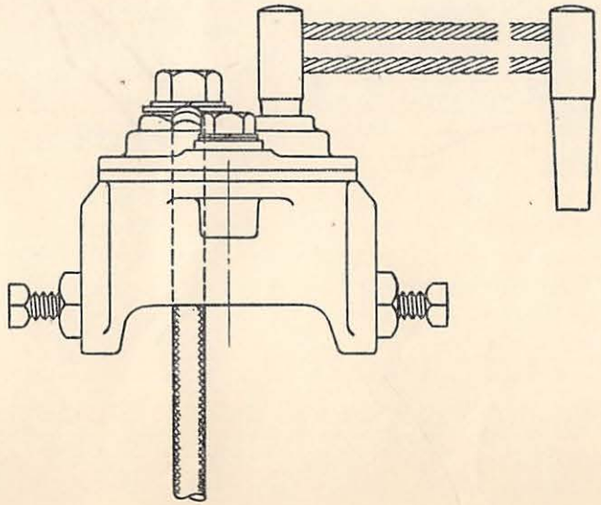
COVER ENDS OF INSULATION WITH TWO LAYERS OF FRICTION TAPE AND APPLY CABLE PAINT.





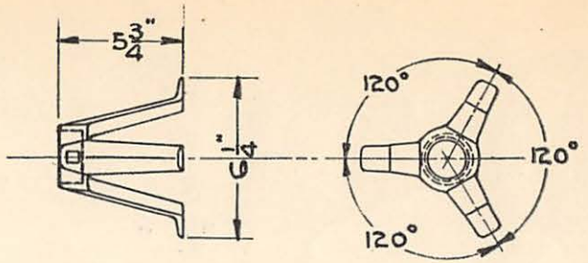
1769-22

RACO PARKWAY BOOTLEG HEAD TYPE 228 COMPLETE FOR 2" PIPE AND SOLID CONDUCTOR, WITH COPPERWELD RAIL CONNECTION 25" LONG.



1769-23

FLATH IMPROVED HEAD FOR 2" PIPE AND DOUBLE PLUG 25" DSI BOND.



1769-21 CABLE GROUND OUTLET BASE

CAST IRON
O.S. FLATH CO. TYPE F22 BASE
COMPLETE WITH CAP SCREW.

NOTE:

BOND PINS TO BE DRIVEN THROUGH THE WEB OF THE RAIL UP TO WITHIN 3/16" OF THE SHOULDER WITH A 3# HAMMER AND INTO THE FLATH IMPROVED HEAD UP TO WITHIN 3/16" OF THE SHOULDER WITH A 1½# HAMMER.

PAINT CONNECTIONS AND TOP SURFACE OF HEAD WITH NO-OXIDE AFTER IN PLACE AND COMPLETELY ASSEMBLED.

SCALE: 6 IN.=1FT. & 1½ IN.=1FT.

N.Y.C.R.R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

TRENCHLAY CABLE GROUND OUTLET

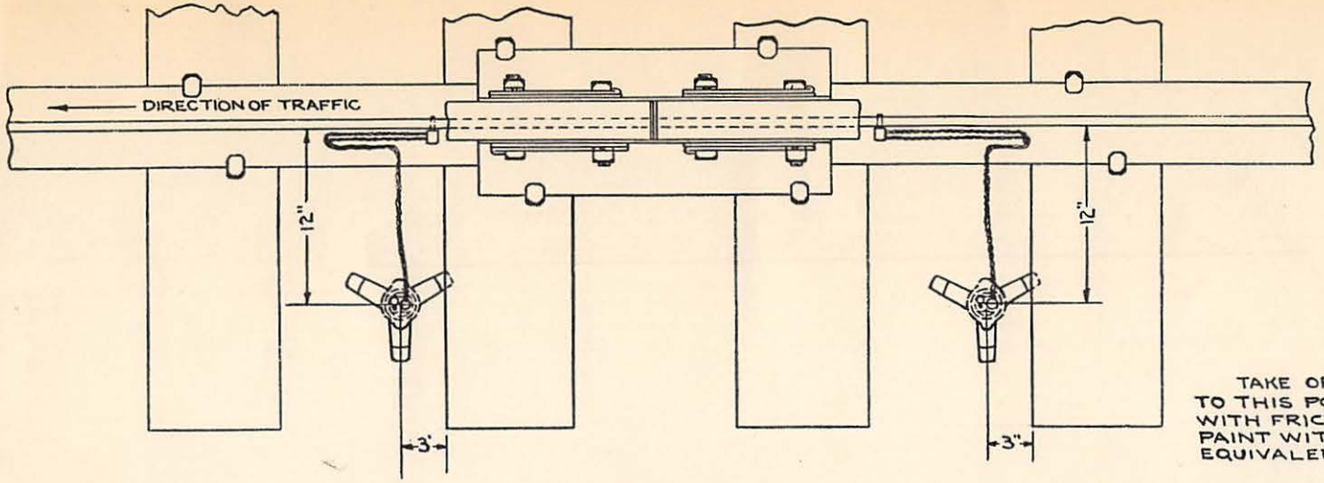
FOR TRACK CONNECTIONS

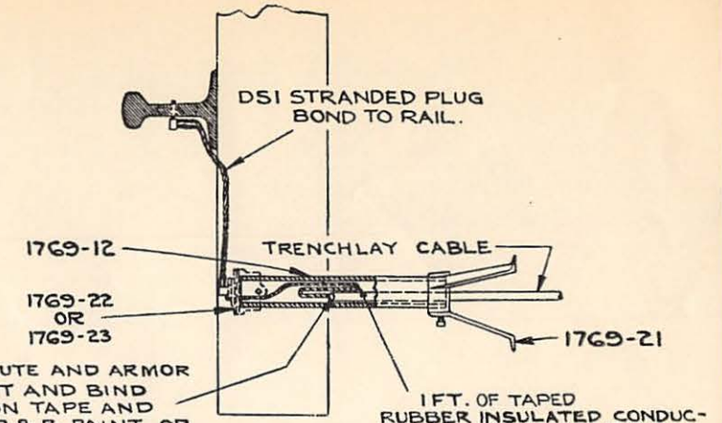
DEC. 22, 1927.

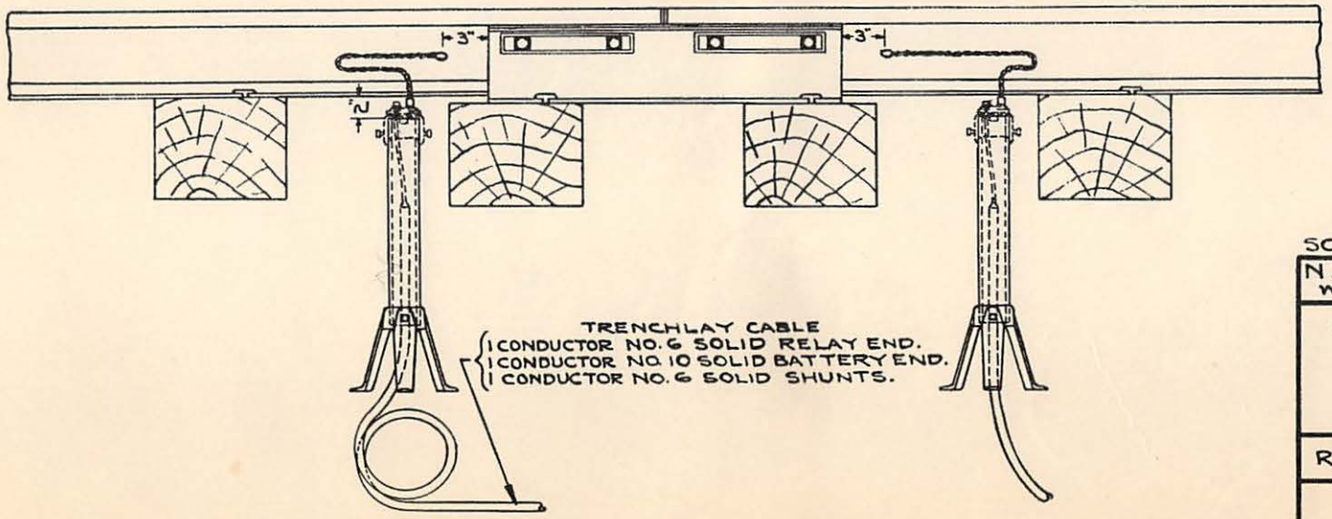
REVISION NO. 6	MARCH 26, 1930.	S-A1769-2

SIGNAL ENGINEER

JC0167







NOTE:
BOND PINS TO BE DRIVEN THROUGH THE WEB OF THE RAIL UP TO WITHIN 3/16" OF THE SHOULDER WITH A 3# HAMMER AND INTO THE FLATH IMPROVED HEAD UP TO WITHIN 3/16" OF THE SHOULDER WITH A 1½# HAMMER.

SCALE: 1 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

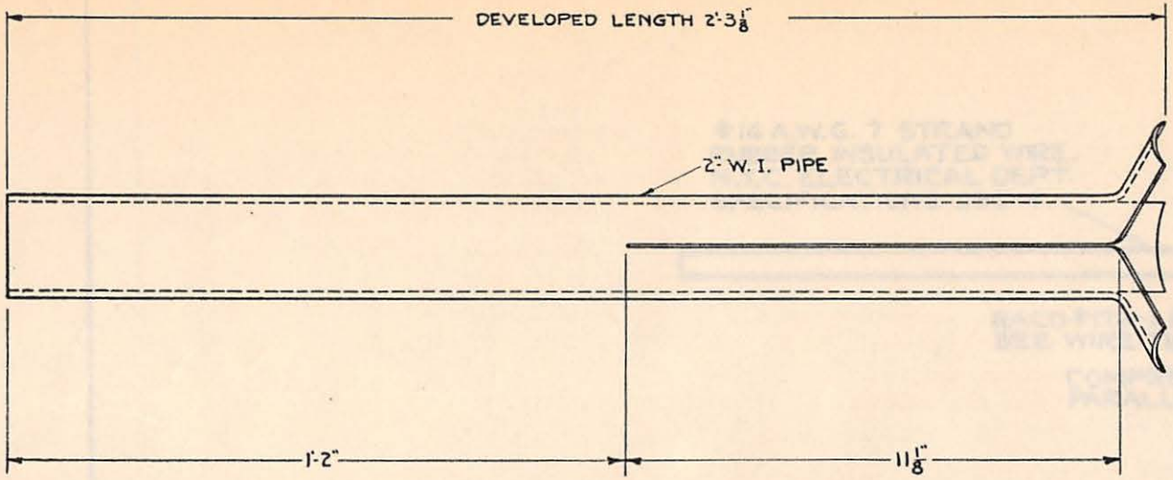
TRENCHLAY GROUND OUTLET RAIL CONNECTIONS

MARCH 26, 1918.

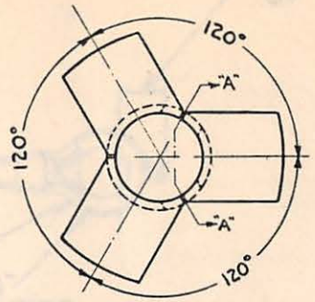
REVISION NO. 12	MARCH 26, 1930.	S-A1769-3

SIGNAL ENGINEER

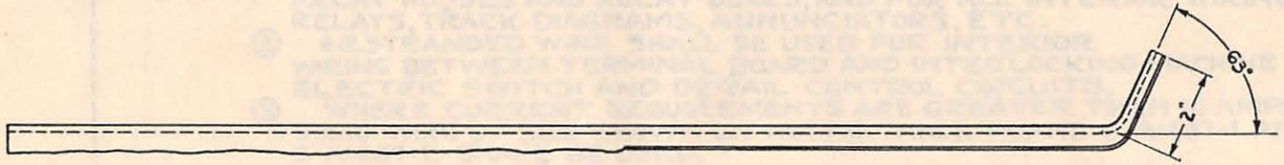
JCO 37



1769-41 CABLE GROUND OUTLET STAND



NOTE:
OUTLET TO BE SHIPPED WITH BOTTOM PROPERLY CUT BUT SPREAD IS TO BE MADE BY FIELD FORCES TO DIMENSIONS SHOWN. SEE S-A1769-2.
TO BE DIPPED IN ASPHALTUM PAINT.



SECTION "AA"

SCALE - 3 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

TRENCHLAY CABLE GROUND OUTLET

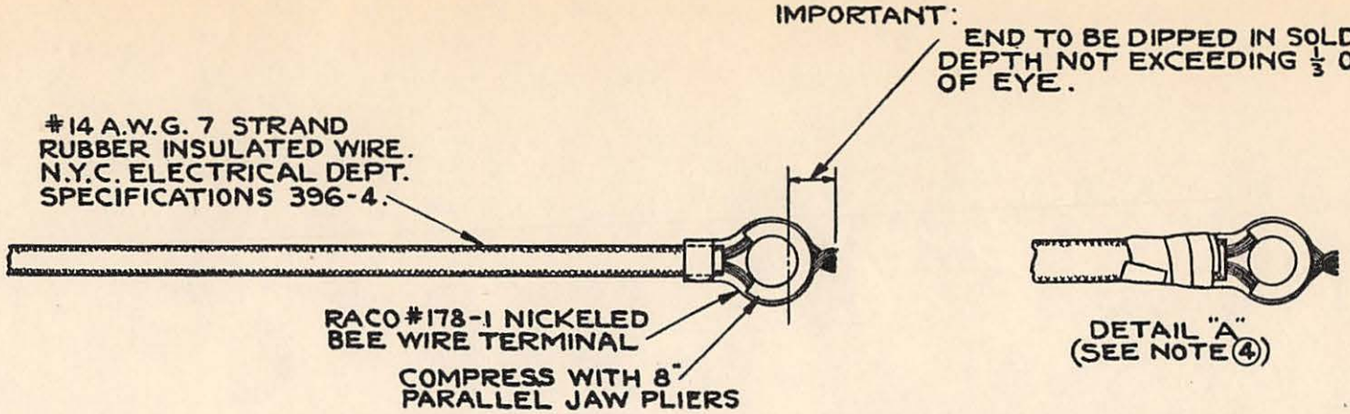
FOR TRACK CONNECTIONS

JAN. 30, 1930.

REVISION NO.		S-A1769-4

SIGNAL ENGINEER.

JCO.208


IMPORTANT:
END TO BE DIPPED IN SOLDER TO DEPTH NOT EXCEEDING 1/3 OF WIDTH OF EYE.
#14 A.W.G. 7 STRAND RUBBER INSULATED WIRE. N.Y.C. ELECTRICAL DEPT. SPECIFICATIONS 396-4.
RACO #178-1 NICKELED BEE WIRE TERMINAL
COMPRESS WITH 8" PARALLEL JAW PLIERS
DETAIL "A" (SEE NOTE ④)

NOTE:

① #14 STRANDED WIRE SHALL BE USED BETWEEN ENTRANCE TERMINALS OR LIGHTNING ARRESTORS AND ALL APPARATUS IN TOWERS, RELAY HOUSES AND RELAY BOXES, AND FOR ALL INTERIOR WIRING FOR RELAYS, TRACK DIAGRAMS, ANNUNCIATORS, ETC.

② #12 STRANDED WIRE SHALL BE USED FOR INTERIOR WIRING BETWEEN TERMINAL BOARD AND INTERLOCKING MACHINE FOR ELECTRIC SWITCH AND DERAIL CONTROL CIRCUITS.

③ WHERE CURRENT REQUIREMENTS ARE GREATER THAN 10 AMPERES SOLID WIRE OF SIZE SHOWN ON WIRING TABLE PLANS S-A1487-1 AND S-A1487-2 SHALL BE USED.

NOTE:

④ WHEN NECESSARY TO USE #12 A.W.G.7 STRAND RUBBER INSULATED WIRE, RACO #178-3 NICKELED BEE WIRE TERMINAL SHALL BE USED AND THE TERMINAL ARMS WHICH ARE WRAPPED AROUND THE INSULATED CONDUCTOR SHALL BE COVERED WITH ONE SERVING OF FRICTION TAPE.

SCALE: FULL SIZE

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

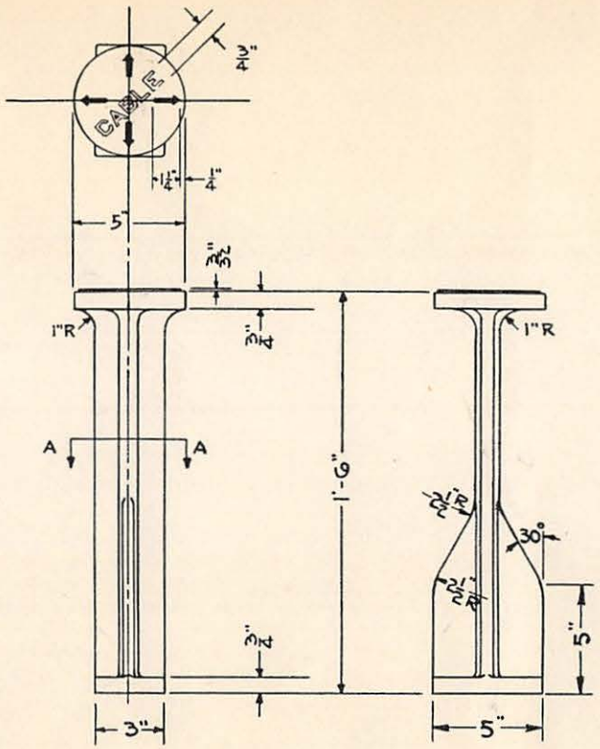
STRANDED WIRE TERMINAL

JAN. 22, 1929.

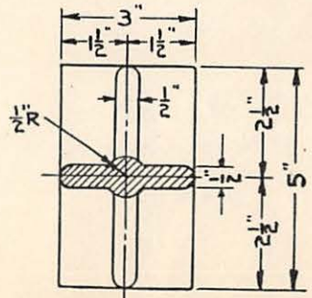
REVISION NO. 2	DEC. 30, 1929	S-A1795-1

SIGNAL ENGINEER

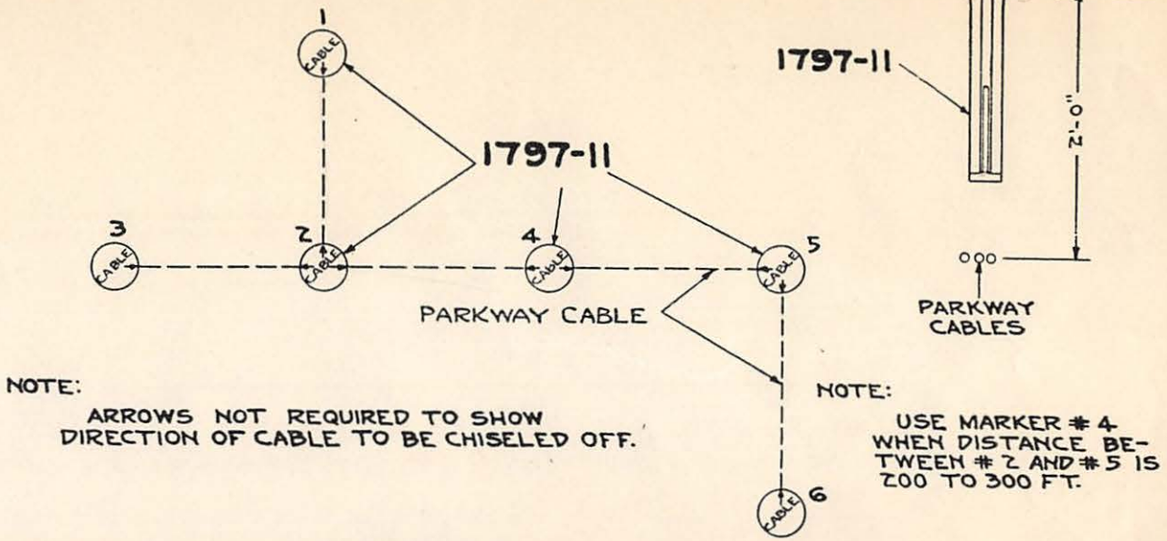
J.Co.13



1797-11 MARKER
CAST IRON



ENLARGED SECTION "A-A"



NOTE:
ARROWS NOT REQUIRED TO SHOW DIRECTION OF CABLE TO BE CHISELED OFF.

NOTE:
USE MARKER # 4 WHEN DISTANCE BETWEEN # 2 AND # 5 IS 200 TO 300 FT.

METHOD OF INSTALLATION

SCALES { 3/4 IN. = 1 FT. / 1½ IN. = 1 FT. / 3 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.

MARKER
TO
LOCATE PARKWAY CABLE RUN
FEB. 15, 1929

REVISION NO. 2	SEPT. 29, 1930.	S-A1797-1

SIGNAL ENGINEER

JCO-26

INSTRUCTIONS FOR DAILY TEST OF HIGHWAY GROSSING BELLS AND SIGNALS

THE EMPLOYE DESIGNATED TO TEST GROSSING BELLS AND SIGNALS MUST MAKE TESTS AS EARLY AS PRACTICABLE EACH DAY AND KNOW THAT APPARATUS IS IN WORKING ORDER. IF BELL OR SIGNAL IS OUT OF ORDER GROSSING MUST BE PROTECTED UNTIL BELL OR SIGNAL IS RESTORED TO SERVICE.

TESTS: BELLS AND SIGNALS MUST BE TESTED BY UNLOCKING TEST BOX AND OPERATING, ONE AT A TIME, EACH PUSH BUTTON OR KNIFE SWITCH IN BOX. BELL SHOULD RING AND SIGNAL SHOULD OPERATE EACH TIME BUTTON IS PUSHED OR SWITCH IS OPENED. AFTER TESTING, BOX MUST BE RELOCKED.

RECORD OF TESTS: REPORT CARD FORM S.C.15, MUST BE KEPT IN EACH BOX CONTAINING PUSH BUTTONS OR SWITCHES. IF BELL AND SIGNAL OPERATE PROPERLY AND SIGNAL LIGHT IS DISPLAYED, MARK "OK" UNDER "CONDITION", DATE AND SIGN CARD. IF BELL OR SIGNAL DOES NOT OPERATE PROPERLY OR LIGHT IS NOT DISPLAYED, MARK "OO" UNDER "CONDITION", DATE AND SIGN CARD AND NOTIFY DISPATCHER OR SIGNAL MAINTAINER. THE EMPLOYE MAKING REPAIRS MUST SHOW THE DATE AND TIME, AND MARK 'REPAIRED' UNDER 'CONDITION' AND SIGN IN THE COLUMN 'TESTED BY', NOTIFY SUPERINTENDENT BY WIRE AND REPORT TO SIGNAL SUPERVISOR ON FORM S.C.3. MAINTAINER MUST ALSO DATE AND SIGN THE CARD WHENEVER HE MAKES INSPECTION OF THE BELL, SIGNAL OR LAMP TO DETERMINE ITS CONDITION.

FORWARDING OF CARDS: AT END OF EACH MONTH THE EMPLOYE DESIGNATED TO MAKE TEST, MUST FORWARD CARD S.C.15, TO SIGNAL SUPERVISOR AND PLACE NEW CARD IN BOX.

(FOLD HERE)

FORM S.C.15.

(NAME OF RAILROAD) R. R. B.

HIGHWAY GROSSING BELL AND SIGNAL REPORT

SIGNAL SUPERVISOR

.....

.....

7

5½

(FRONT)

STATION ..... NAME AND NUMBER OF GROSSING ..... MONTH 19

DATE	TIME A.M.	TIME P.M.	CONDITION O.K.	CONDITION OUT OF ORDER	TESTED BY	DATE	TIME A.M.	TIME P.M.	CONDITION O.K.	CONDITION OUT OF ORDER	TESTED BY

(BACK)

FORM SC-15

NOTE—THIS FORM TO BE PRINTED ON MANILLA CARDS, SIZE 5½ X 7 INS.- FOLD.

0 1 2

SCALE OF INCHES

SIGNAL NEW YORK CENTRAL LINES COMMITTEE

REPORT BLANK

GROSSING BELL AND SIGNAL REPORT FORM S.C.15.

N.Y.C.R.R.(E.), N.Y.C.R.R.(W.), B.&A.R.R., M.C.R.R., C.C.C.&St.L.RY., P.&L.E.R.R., RUTLAND R.R., N.Y.G.R.R.(OCL.).

SC-15

JULY 22' 1926

JULY 9' 1929

APPROVED BY REPRESENTATIVES OF LINES SHOWN.

J C Mock CHAIRMAN

G.W.B.
U.S.R.S.Co.
SWISSVALE

A - CLASSIFICATION - PLAN - PLAN SIZE

S-A1A1 Classification of Standard Plans
S-A2A to S-A2G Inclusive - Standard Plan Index
S-A3A1 Standard Plan Size
S-A3B1 Location Plan Size

B-ENGINEERING DATA - CHARTS - TABLES - CLEARANCE DIAGRAMS

S-B7A Schematic Arrangement Remote Controlled Manual Block Stations
S-B8A Capacity of Battery Boxes
S-B9A4 Schematic Numbering - C.T.C. Type Electric Interlocking
S-B9B1 Schematic Machine Numbering - Two Tracks Mechanical Interlocking
S-B9C Schematic Machine Numbering - Three Tracks - Mechanical Interlocking
S-B18A2 Road Diagram Symbols
S-B20A1 Pole Line Arrangement - Auto Block Signals Single Track
S-B20B1 Pole Line Arrangement - Auto Block Signals Two Tracks
S-B20C1 Pole Line Arrangement - Auto Block Signals Three Tracks
S-B20D1 Pole Line Arrangement - Auto Block Signals Four Tracks
S-B21A Signal Clearance - C. L. High Signals
S-B21B Signal Clearance - C. L. Dwarf Signals
S-B21C Signal Clearance - C. L. Dwarf Signals
S-B21D Signal Clearance - Semaphore High Signals
S-B21E Signal Clearance - C. L. Signals - 5 Ft. Truss Bridge
S-B21F Signal Clearance - C. L. Signals - 7 Ft. Truss Bridge
S-B21G Track Pan Lights Clearance
S-B22B1 120 V. and 460 V. Signal Transformer Terminal Arrangement
S-B23A1 Wire Tagging
S-B27A1 to S-B27C1 Inclusive - Circuit Nomenclature
S-B29A5 Schematic Arrangement of Cable Ground Outlets for Switch Lamp Lighting S-A 1769-4

F - FOUNDATIONS - POSTS - OTHER CONCRETE MATERIAL

S-F3A4 Concrete Foundation - For Electric Switch Lock
S-F4A5 Concrete Foundations - For Ground and Bracket Mast Signals
S-F4B4 Concrete Foundation - Type "SA" and "SC" Dwarf Signal
S-F5A2 Foundation Extensions
S-F5B2 Foundation Extensions
S-F5C2 Foundation Extensions
S-F5D2 Foundation Extensions
S-F5L2 Foundation Extensions

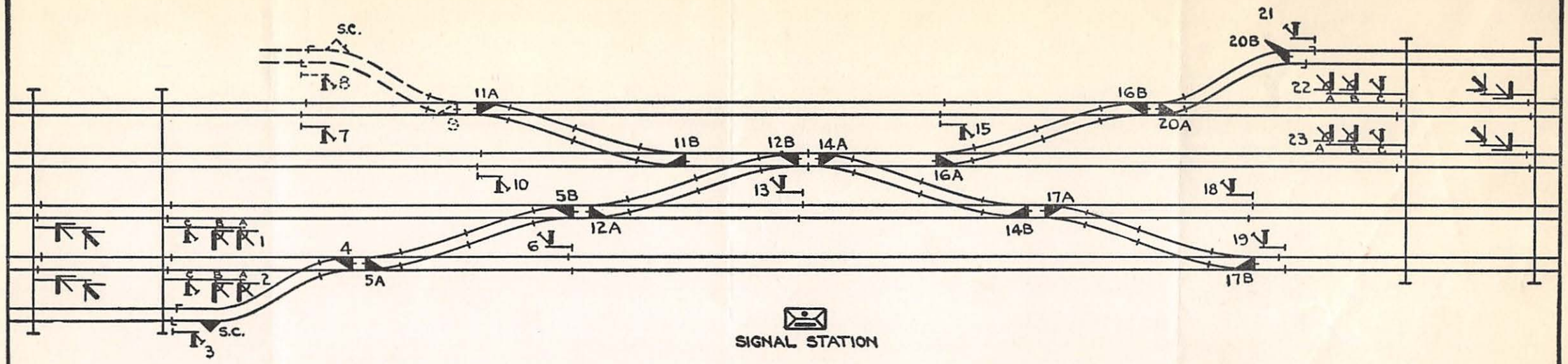
S-F8A Foundation and Adaptors - For C. L. Dwarf Signals

N.Y.C.R.R. Signal Department Cleveland, Ohio

STANDARD PLAN INDEX

Revision No. 2 April 2, 1953 S-A2A

T.P.C.O.
LOUISVILLE



N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

SCHEMATIC NUMBERING

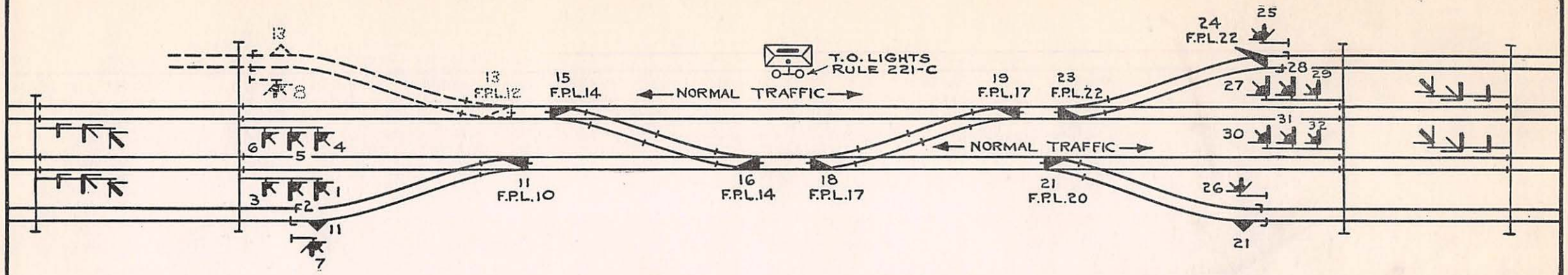
ALL RELAY TYPE ELECTRIC INTERLOCKING

DATED APRIL 5, 1934.	REV. MAR. 24, 1952.	S-B9A4

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. C. & ST. L. RY.
M. C. R. R.

SIGNAL ENGINEER

G.W.B.
U.S.R.S.
SWISSVALE



MECHANICAL MACHINE

15 LEVERS FOR 16 SIGNALS
8 LEVERS FOR 7 SWITCHES & 3 DERAILS
5 LEVERS FOR 8 F.P. LOCKS

28 WORKING LEVERS
4 SPARE SPACES 8-9-12-13

32 LEVER FRAME

N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.

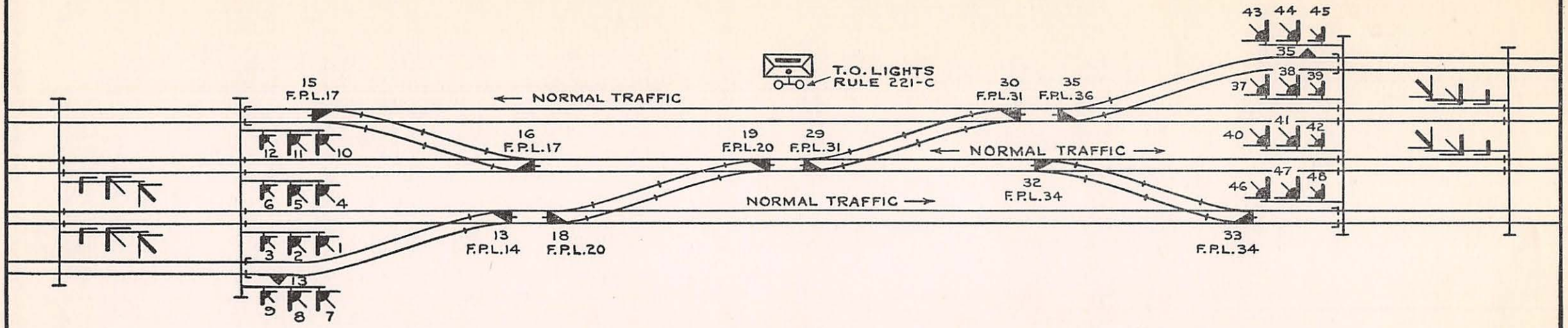
SCHEMATIC MACHINE NUMBERING

TWO TRACKS
MECHANICAL INTERLOCKING

DATED DEC. 8, 1942.	REV. MAY 9, 1952	S-B9B1

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

SIGNAL ENGINEER



MECHANICAL MACHINE

24 LEVERS FOR 24 SIGNALS
10 LEVERS FOR 10 SWITCHES & 3 DERAILS
6 LEVERS FOR 6 F. P. LOCKS

40 WORKING LEVERS
8 SPARE SPACES 21-22-23-24-25-26-27-28

48 LEVER FRAME

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

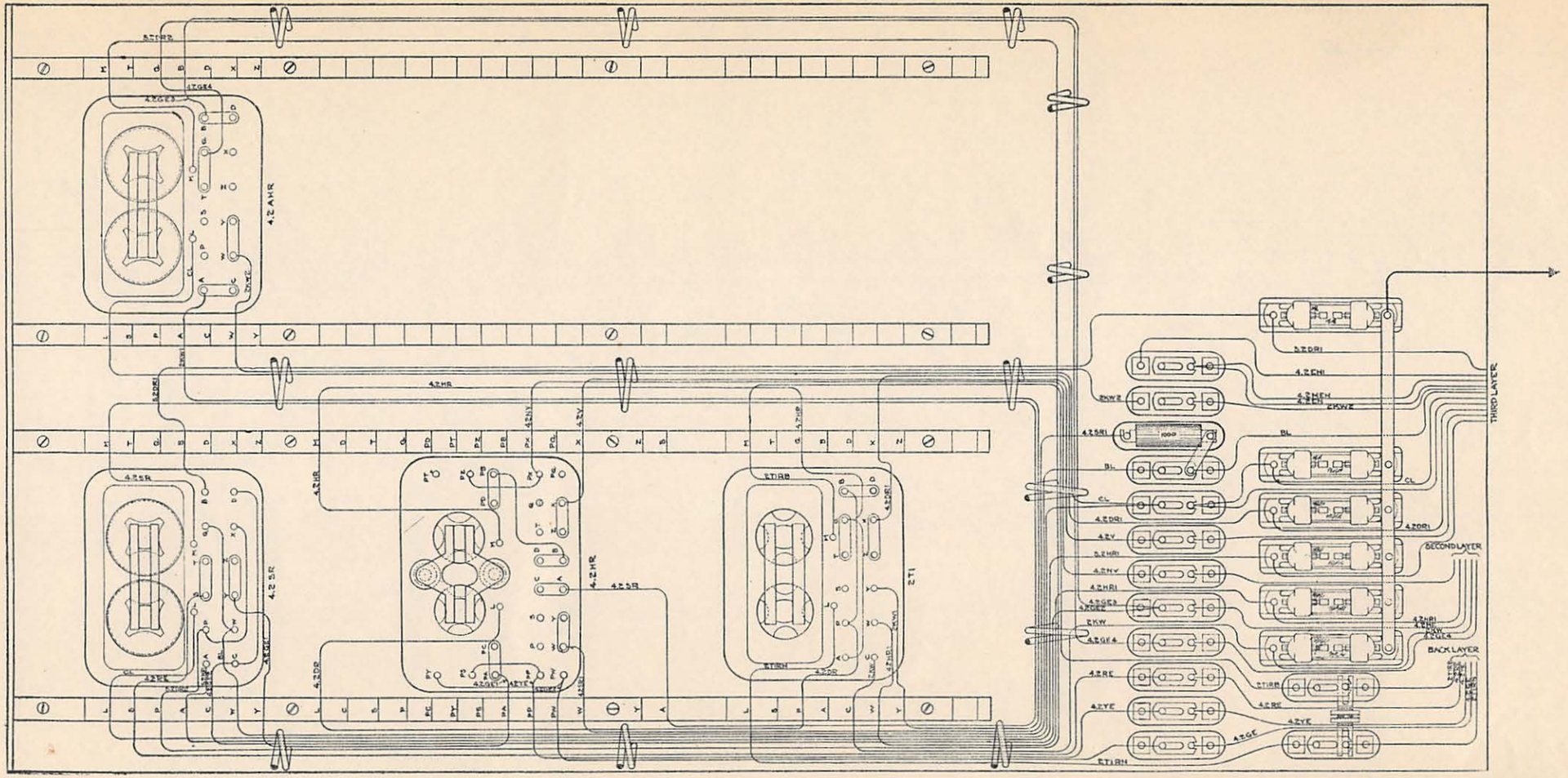
SCHEMATIC MACHINE NUMBERING

THREE TRACKS
MECHANICAL INTERLOCKING

DATED MAY 9, 1952	REV.	S-B9C

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

SIGNAL ENGINEER



NOTE:
GRAY BAR ELECTRIC CO. ENAMELED BRIDLE RINGS TO BE USED.

STYLE	SIZE
E	5"
C	1 1/4"

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

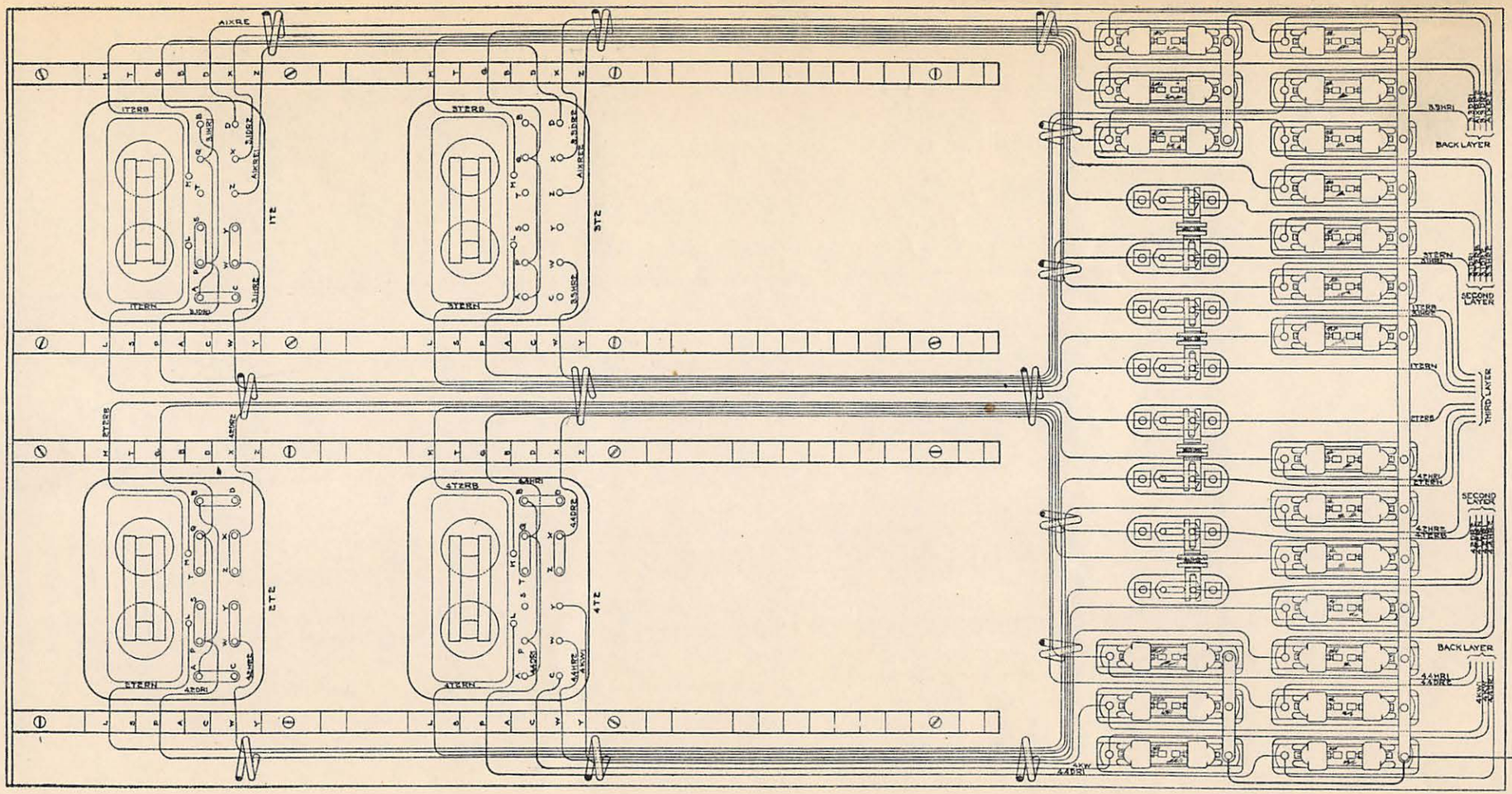
WIRING DIAGRAM

RELAY BOX COLOR LIGHT SIGNALS
G.R.S. AUTO-MANUAL TRAIN CONTROL
ONE TRACK SIGNAL
NOV. 23, 1922.

REVISION NO. 1.	JAN. 30, 1930.	S-D1623-1

SIGNAL ENGINEER.

JCO 208



NOTE:
GRAY BAR ELECTRIC CO. ENAMELED BRIDLE RINGS TO BE USED.

STYLE	SIZE
E	5/8"
C	1 1/4"

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

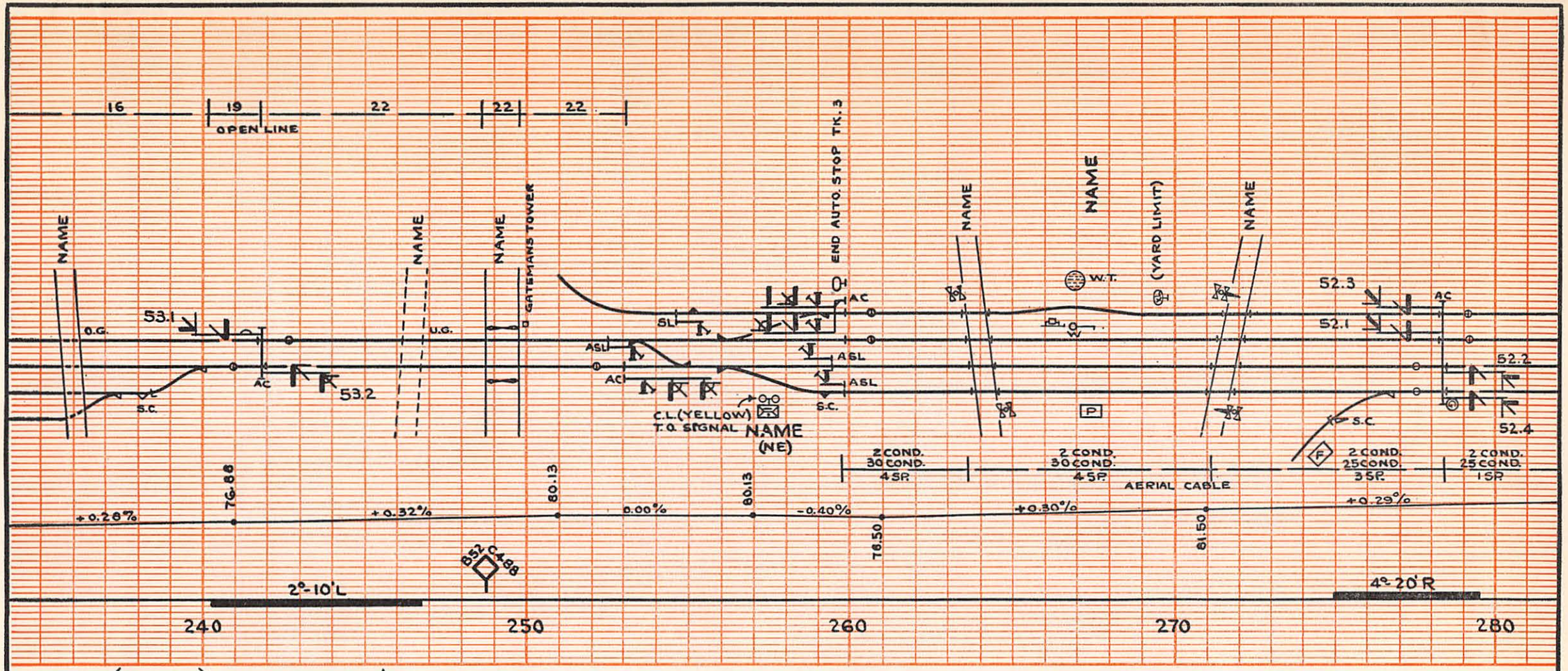
WIRING DIAGRAM

RELAY BOX COLOR LIGHT SIGNALS
FOUR TRACK CUT SECTION
NOV. 23, 1922.

REVISION NO. 1	JAN. 30, 1930.	S-D1623-2

SIGNAL ENGINEER.

JCO 205



CURVE { L = LEFT, R = RIGHT } - IN THE DIRECTION OF INCREASING CHAINAGE

GRADE { + = ASCENDING WITH CHAINAGE. - = DESCENDING WITH CHAINAGE. 0.00 = LEVEL

SCALES { HORIZONTAL $\frac{1}{4}$ IN. = 100 FT. VERTICAL $\frac{1}{20}$ IN. = $3\frac{1}{4}$ FT.

NOTES:

VERTICAL SCALE ONLY APPLIES TO GRADE LINE AND TRACK ARRANGEMENT.

WHERE SPECIAL APPARATUS IS SHOWN INDICATE BY NAME OR DESCRIPTION.

KEUFFEL AND ESSER CO. STANDARD PROFILE CLOTH PLATE A4 X 20 OR EQUIVALENT SHALL BE USED FOR MAKING ROAD DIAGRAM TRACINGS.

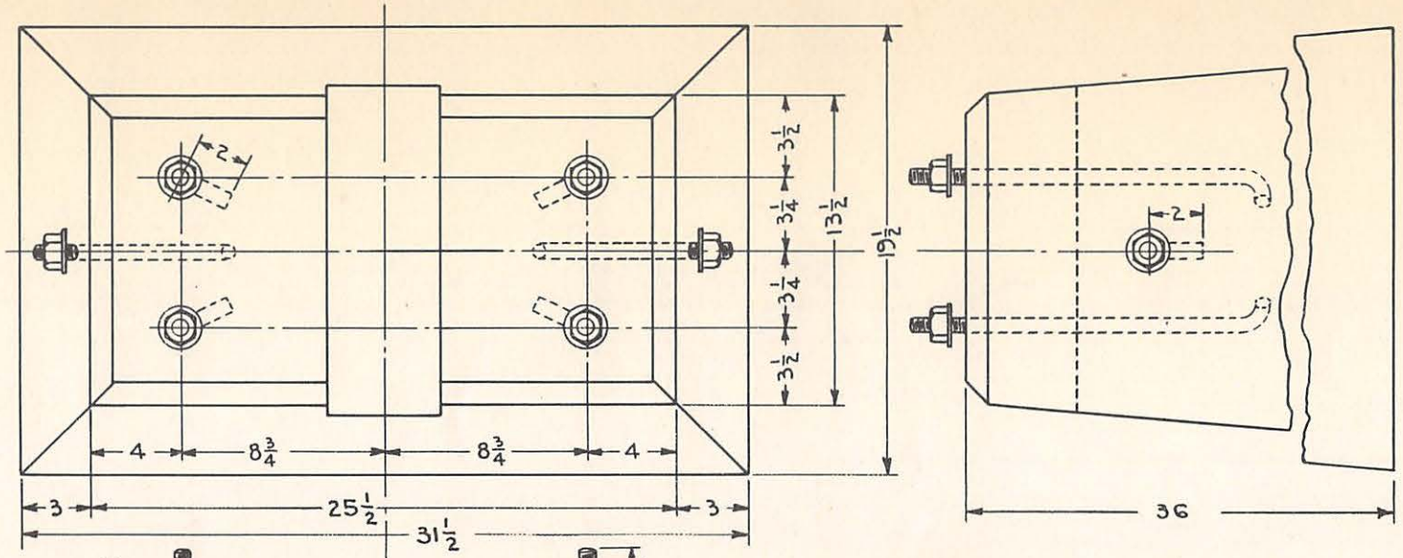
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

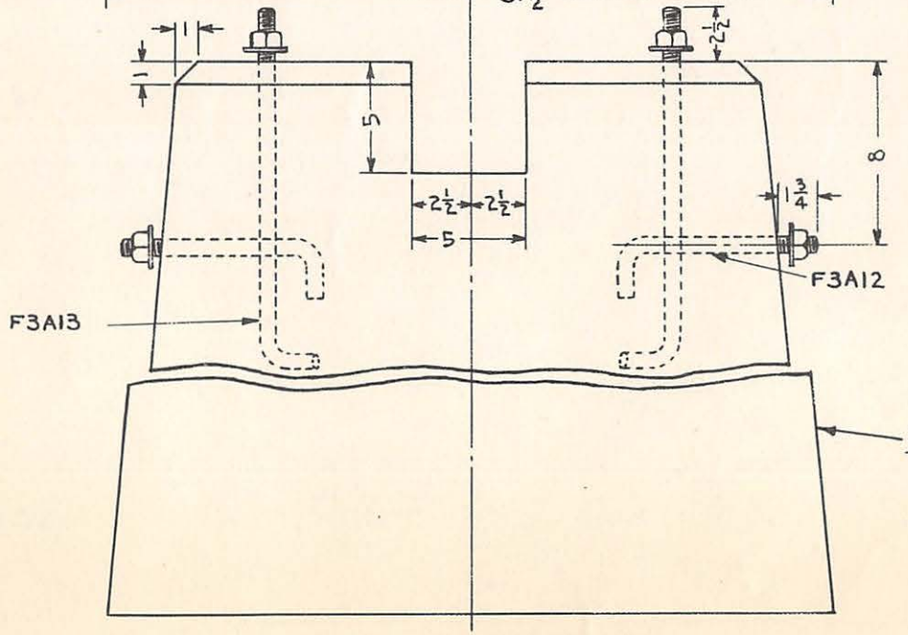
ROAD DIAGRAM SYMBOLS

DATED DEC 7, 1934	REV. JUNE 20, 1952	S-B18A2

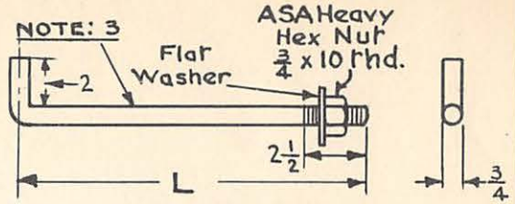
APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

J. A. Concoran
SIGNAL ENGINEER





F3A1 FOUNDATION



ANCHOR BOLT

F3A12 L=8

F3A13 L=15

NOTES:

1. Foundation shall be made of Portland cement concrete in accordance with American Railway Engineering Association Specification.
   Coarse agregate shall consist of ¾ inch maximum size stone or gravel.
   Not less than 6 sacks of cement shall be used per cubic yard of concrete.
   Water cement ratio to produce a compressive strength of 2500 pounds per square inch after 28 days shall be used.
2. Use of precast foundation (Permacrete foundation S-8 with 6½ x 17½ inch centers or equal) in place of F3A1 is optional.
3. Anchor bolt shall be C1020 steel, galvanized or cadmium plated after threads have been cut.

0 3 6 9 12

Scale and all dimensions given in inches

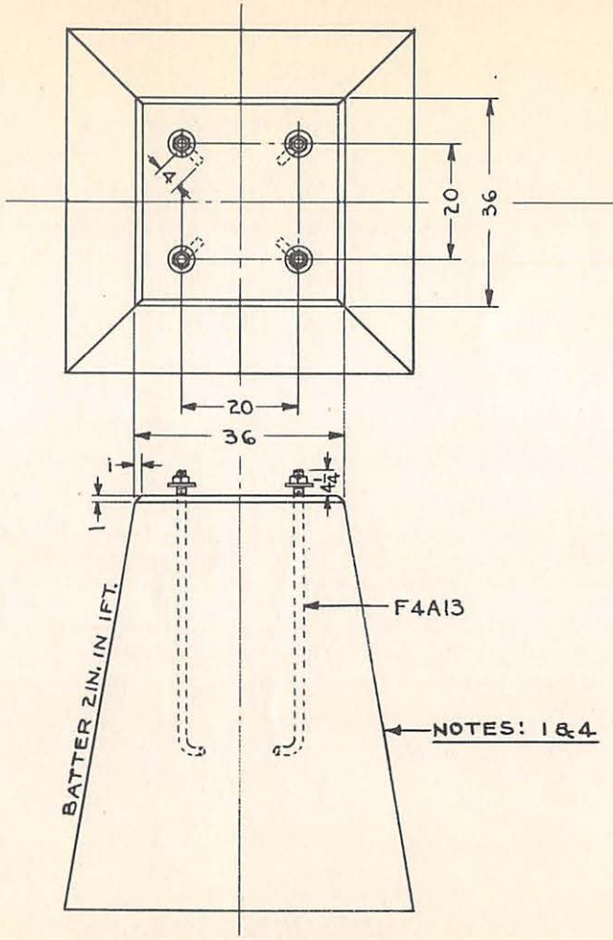
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

CONCRETE FOUNDATION
FOR ELECTRIC SWITCH LOCK

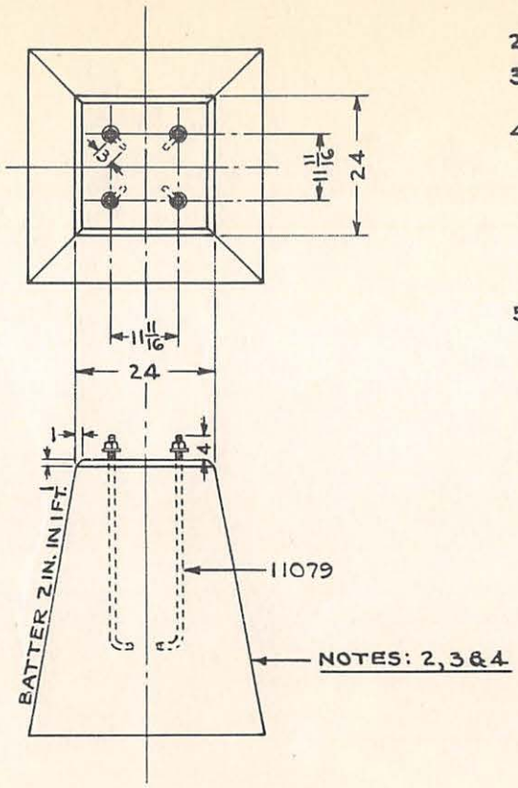
DATED APR. 20, 1934	REV. FEB. 19, 1953	S-F3A4

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C & ST.L. RY.
M.C.R.R.

J. Kozeran
SIGNAL ENGINEER

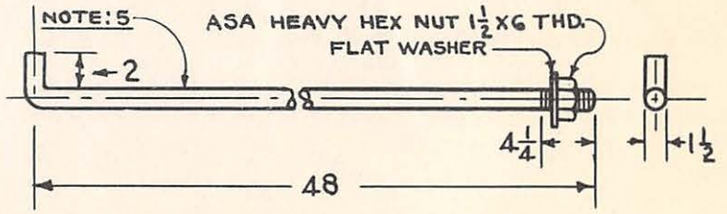


F4A1 FOUNDATION
FOR BRACKET MAST SIGNALS



F4A2 FOUNDATION
FOR GROUND MAST SIGNALS

NOTES:
1. BOTTOM OF FOUNDATION F4A1 SHALL BE NOT LESS THAN 5 FT. IN GROUND AND NOT LESS THAN 6 FT. IN GROUND WHEN BRACKET MAST IS FOR THREE ARM SIGNAL.
2. BOTTOM OF FOUNDATION F4A2 SHALL BE NOT LESS THAN 4 FT. IN GROUND.
3. USE OF PRECAST FOUNDATION (PERMACRETE S-2, WITH 4 S-2 2 PIECE SPIDERS - OR EQUAL) IN PLACE OF FOUNDATION F4A2 IS OPTIONAL.
4. FOUNDATION SHALL BE MADE OF PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING ASSOCIATION SPECIFICATION.
   COARSE AGGREGATE SHALL CONSISTS OF ¾ IN. MAXIMUM SIZE STONE OR GRAVEL.
   NOT LESS THAN 6 SACKS OF CEMENT SHALL BE USED PER CUBIC YARD OF CONCRETE.
   WATER CEMENT RATIO TO PRODUCE A COMPRESSIVE STRENGTH OF 2500 POUNDS PER SQUARE INCH AFTER AFTER 28 DAYS SHALL BE USED.
5. ANCHOR BOLT SHALL BE C1020 STEEL, GALVANIZED OR CADMIUM PLATED AFTER THREADS HAVE BEEN CUT.



F4A13 - ANCHOR BOLT

ALL DIMENSIONS GIVEN IN INCHES

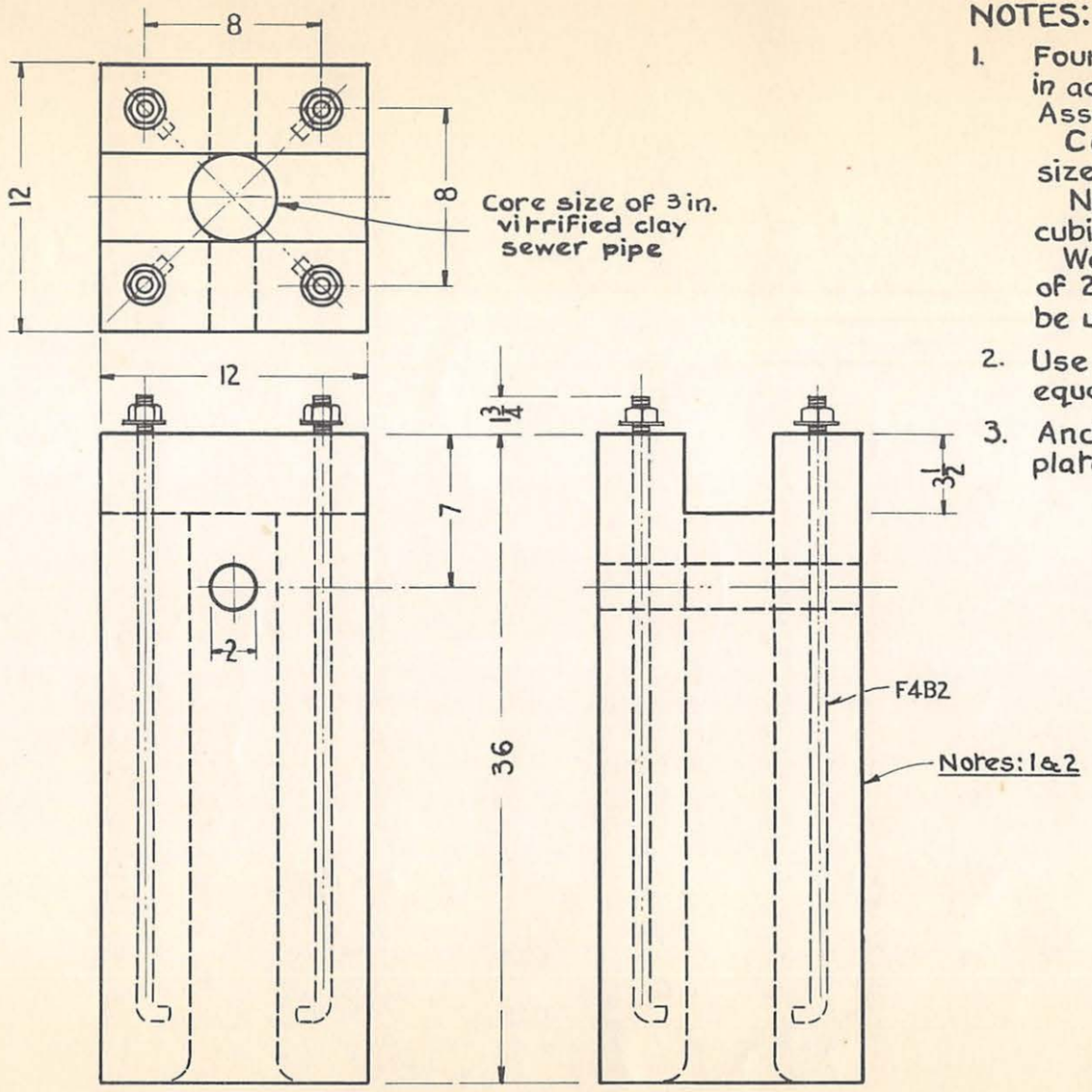
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

CONCRETE FOUNDATION
FOR GROUND AND BRACKET MAST SIGNALS

DATED MAY 14, 1934	REV. FEB. 19, 1953	S-F4A5

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

SIGNAL ENGINEER



F4B1 - FOUNDATION.

NOTES:

1. Foundation shall be made of Portland cement concrete in accordance with American Railway Engineering Association Specification.
   Coarse aggregate shall consist of 3/4 inch maximum size stone or gravel.
   Not less than 6 sacks of cement shall be used per cubic yard of concrete.
   Water cement ratio to produce a compressive strength of 2500 pounds per square inch after 28 days shall be used.
2. Use of precast Foundation (Permacrete Foundation H13 or equal) in place of F4B1 is optional.
3. Anchor bolt shall be C1020 steel, galvanized or cadmium plated after the threads have been cut.

F4B2-ANCHOR BOLT

All Dimensions given in inches

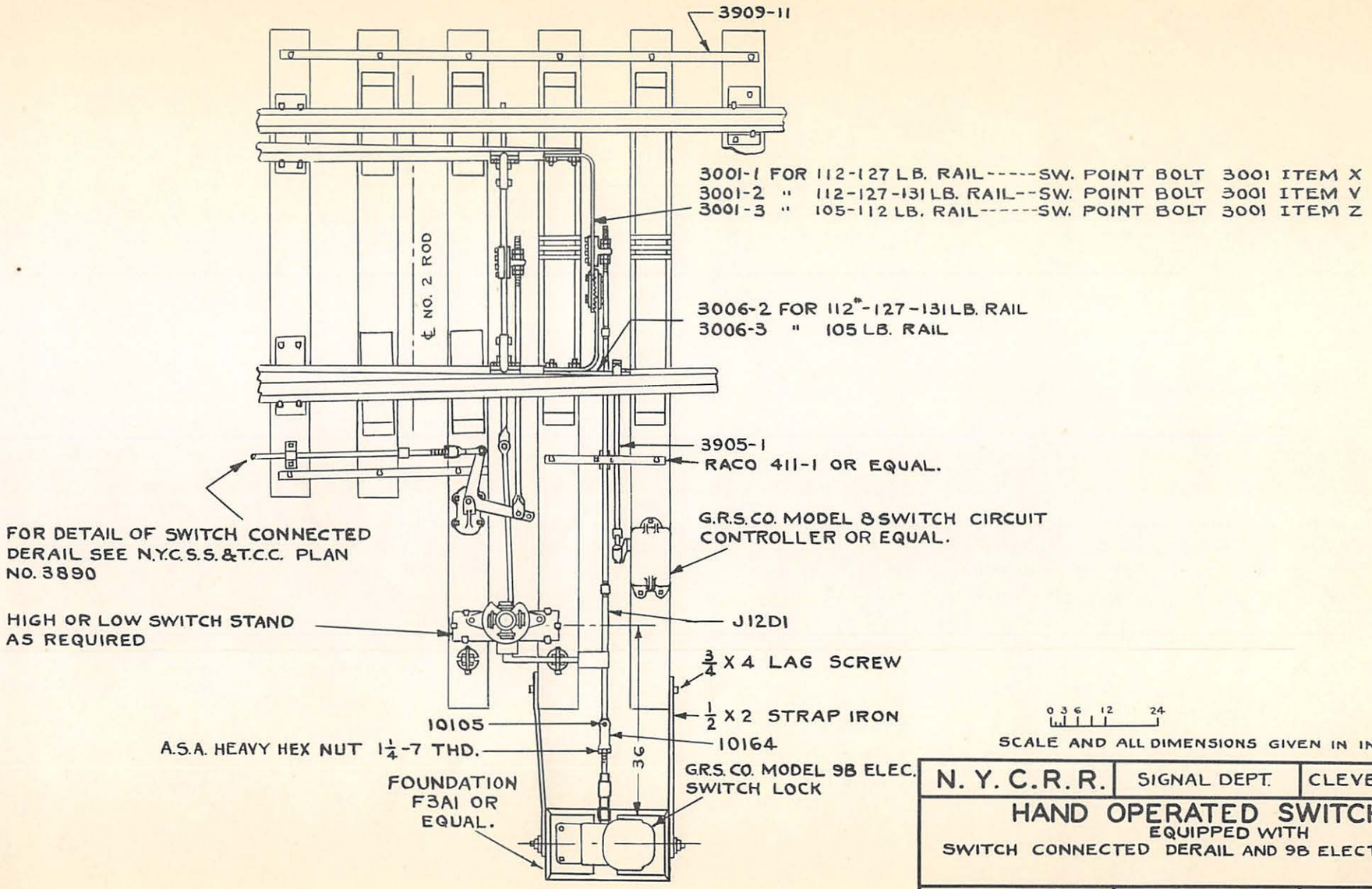
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

CONCRETE FOUNDATION
TYPE "SA" AND "SC" DWARF SIGNAL

DATED MAR. 25, 19	REV. FEB. 19, 1953	S-F4B4

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. C. & ST. L. RY.
M. C. R. R.

SIGNAL ENGINEER


3909-11
3001-1 FOR 112-127 LB. RAIL-----SW. POINT BOLT 3001 ITEM X
3001-2 " 112-127-131 LB. RAIL--SW. POINT BOLT 3001 ITEM V
3001-3 " 105-112 LB. RAIL------SW. POINT BOLT 3001 ITEM Z
℄ NO. 2 ROD
3006-2 FOR 112#-127-131 LB. RAIL
3006-3 " 105 LB. RAIL
3905-1
RACO 411-1 OR EQUAL.
G.R.S. CO. MODEL 8 SWITCH CIRCUIT CONTROLLER OR EQUAL.
FOR DETAIL OF SWITCH CONNECTED DERAIL SEE N.Y.C.S.S.&T.C.C. PLAN NO. 3890
HIGH OR LOW SWITCH STAND AS REQUIRED
J12D1
3/4 X 4 LAG SCREW
1/2 X 2 STRAP IRON
10105
10164
A.S.A. HEAVY HEX NUT 1 1/4-7 THD.
36
GR.S. CO. MODEL 9B ELEC. SWITCH LOCK
FOUNDATION F3A1 OR EQUAL.

0 3 6 12 24

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

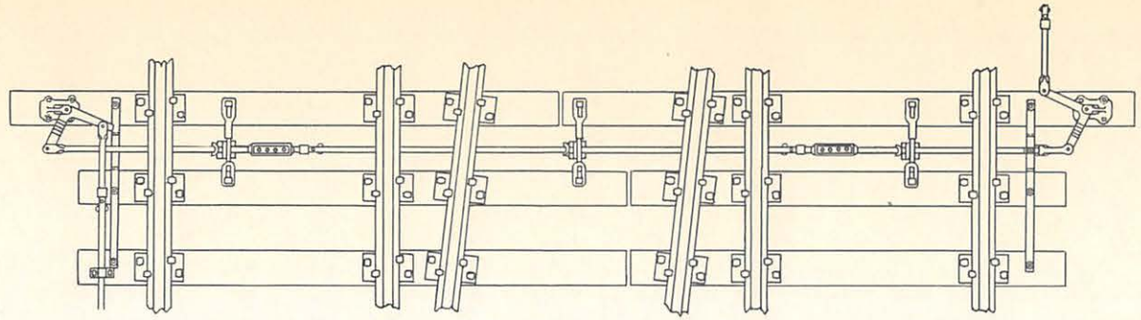
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

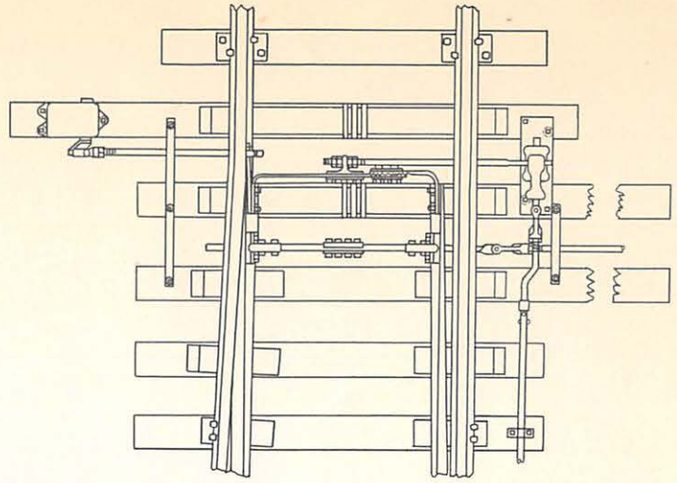
HAND OPERATED SWITCH
EQUIPPED WITH
SWITCH CONNECTED DERAIL AND 9B ELECTRIC LOCK

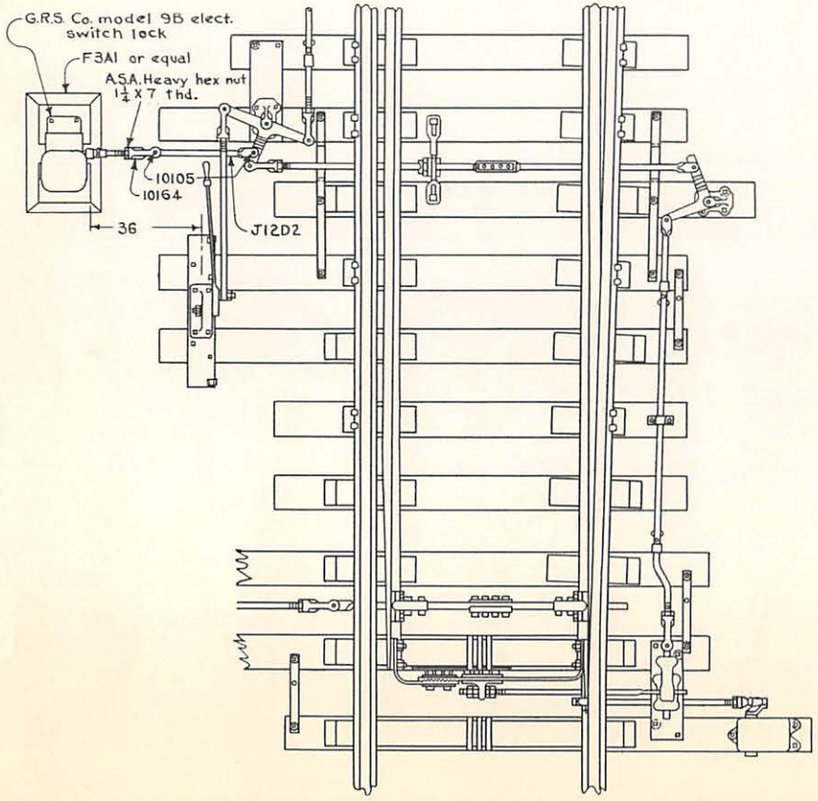
DATED APRIL 20, 1934	REV. DEC. 9, 1952	S-H3A2

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST.L. RY.
M.C.R.R.

J. Foreman
SIGNAL ENGINEER







NOTE:

See N.Y.C.S. S.&T.C.C. plan 3710 for details of Bolt-Locking other than shown.

0 3 6 9 12 24 36

Scale and all dimensions given in inches.

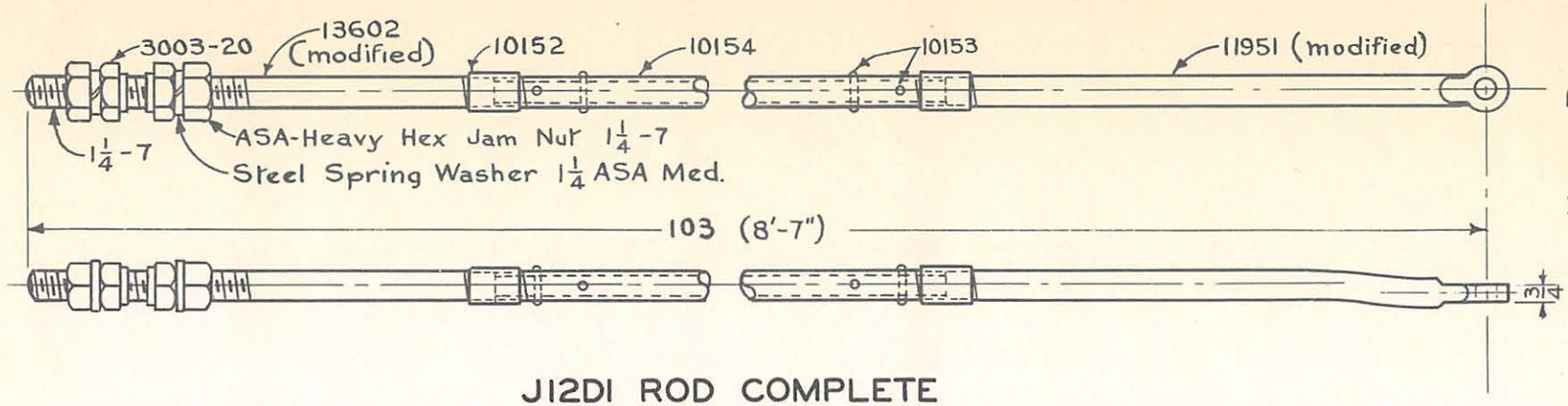
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

BOLT LOCKING – ELECTRICALLY LOCKED
THROW-OVER LEVER OPERATED
FOR CROSSOVER

DATED DEC. 3, 1952	REV.	S-H3B

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. C. & ST. L. RY.
M. C. R. R.

J. Morrison
SIGNAL ENGINEER

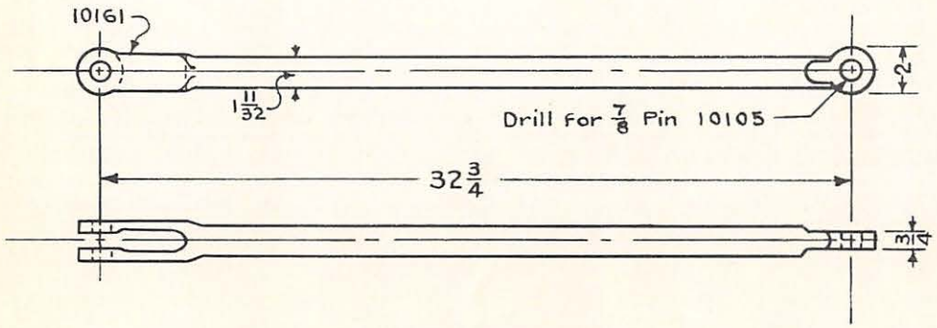


NOTES:

1. Protective treatment to be in accordance with N.Y.C.S. S.&T.C.C. Instruction 350.
2. External threads shall be ASA-UNC-2A with rounded root throughout. Internal threads shall be ASA-UNC-2B.

J12D1 ROD COMPLETE

For Layout S-H3A2



J12D2 ROD

(C1020 Steel)

For Layout S-H3B

0 3 6 9 12

Scale and all dimensions given in inches

N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.

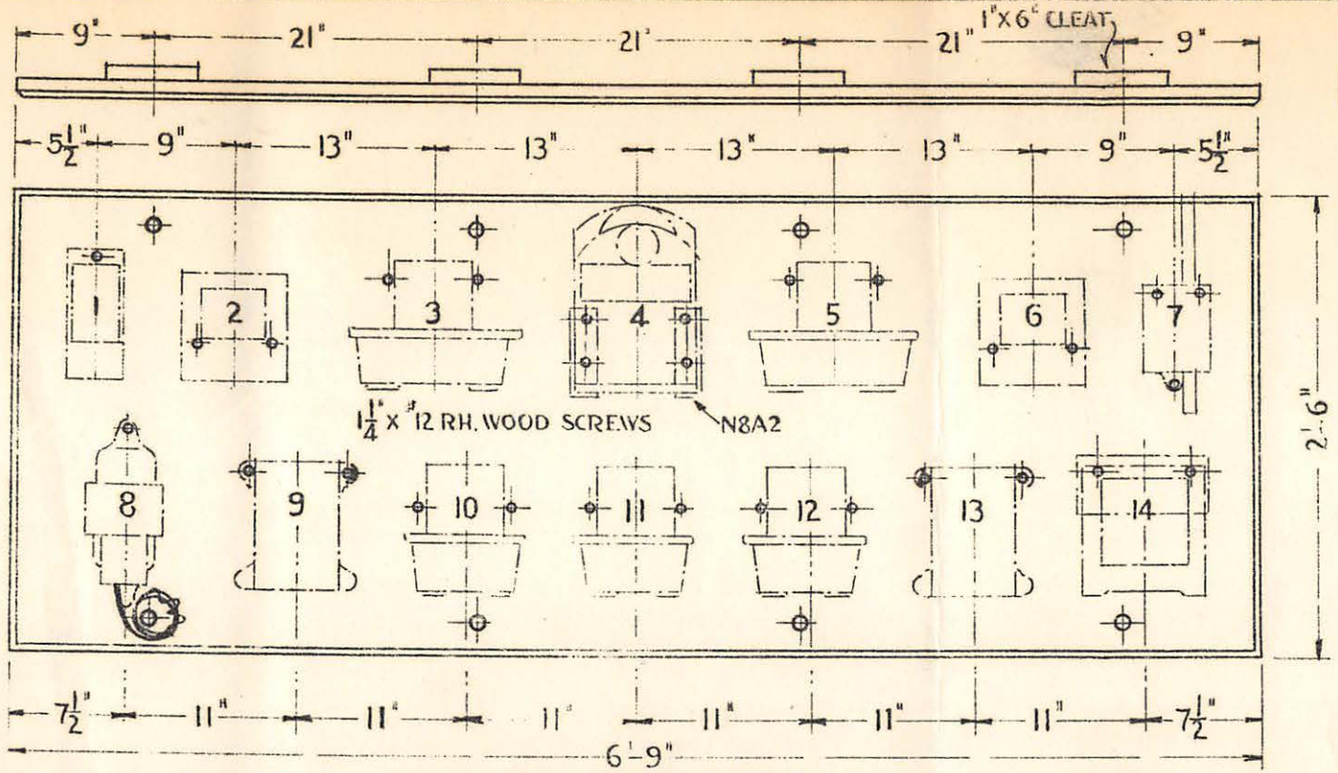
CONNECTING RODS

FOR MODEL 9B
ELECTRIC SWITCH LOCK APPLICATIONS

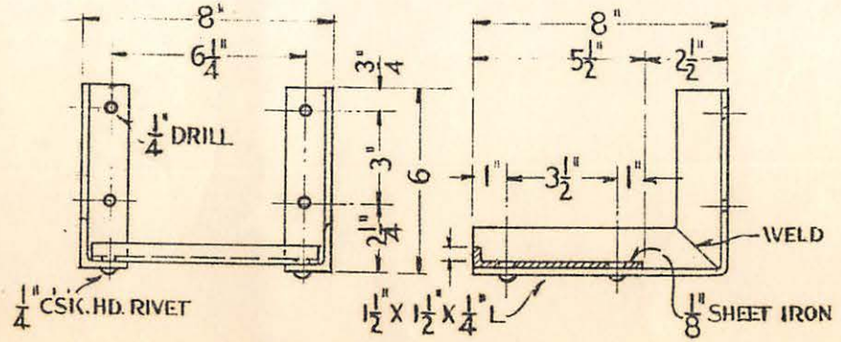
DATED APR. 20, 1934	REV. DEC. 9, 1952	S-J12D1

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST.L. RY.
M.C.R.R.

SIGNAL ENGINEER



N8A1 BOARD ONLY



N8A2 BRACKET

NOTE BOARD SHALL BE MADE OF WELL SEASONED PINE 1 5/16" THICK, DRESSED BOTH SIDES, CLEATED AND FINISHED WITH ONE COAT MISSION OAK STAIN AND TWO COATS SHELLAC.
BOARD SHALL BE FASTENED TO WALL WITH ¾" X 6" LAG SCREWS AND WASHERS.

INSTRUMENTS SHALL BE OF TYPE IN SERVICE AT INTERLOCKING.

1 — POWER OFF RELAY
2 — RECTIFIER
3 — POLAR RELAY, CLASS 'SS'
4 — SIGNAL MECHANISM
5 — POLAR RELAY, CLASS 'C'
6 — RECTIFIER
7 — 15 SECOND MECH. TIME RELEASE OR THERMAL RELAY
8 — TRANSFORMER, 440 V. – 115 V.
9 — " 110 V. – 12¾ V. USED ON ELECTRIC DIV. ONLY
10 — NEUTRAL RELAY, 4 OHM. NOT USED ON ELECTRIC DIV.
11 — " " 7 " " " " " " "
12 — " " 500 "
13 — TRANSFORMER 115 V. 27¾ V.
14 — TRACK RELAY, A.C. TYPE 'N'. USED ON ELEC. DIV. ONLY

SWITCH MACHINE, AUTOMATIC STOP INDUCTOR SHALL BE MOUNTED SEPARATELY ON RACKS AT INTERLOCKINGS WHERE USED.

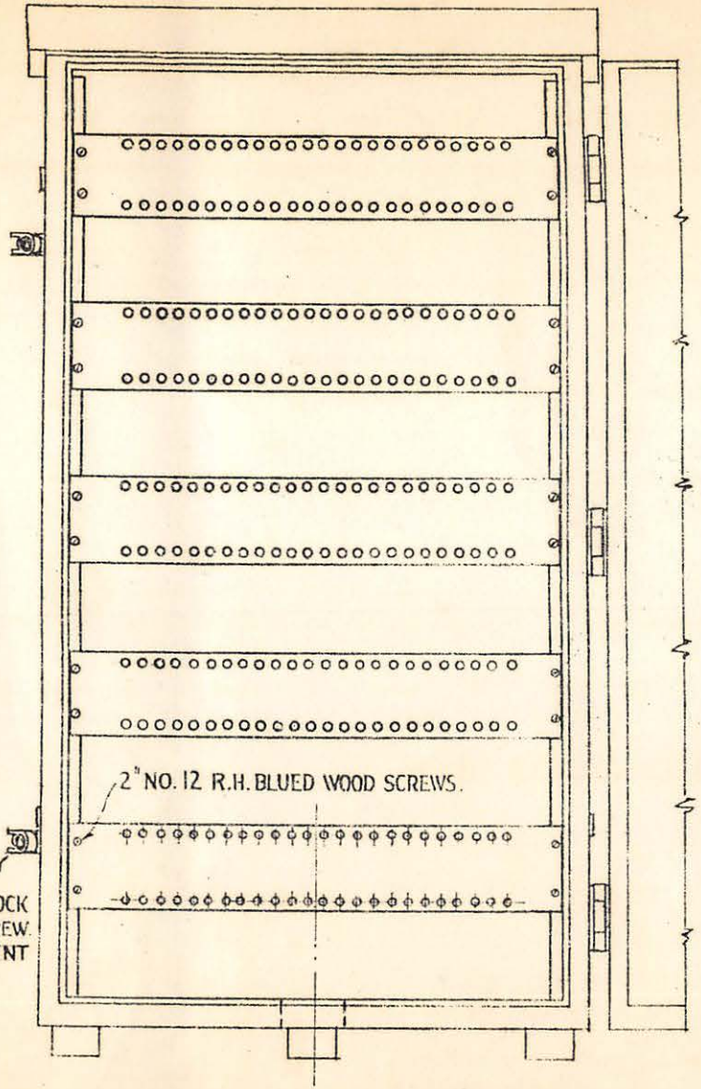
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND O.

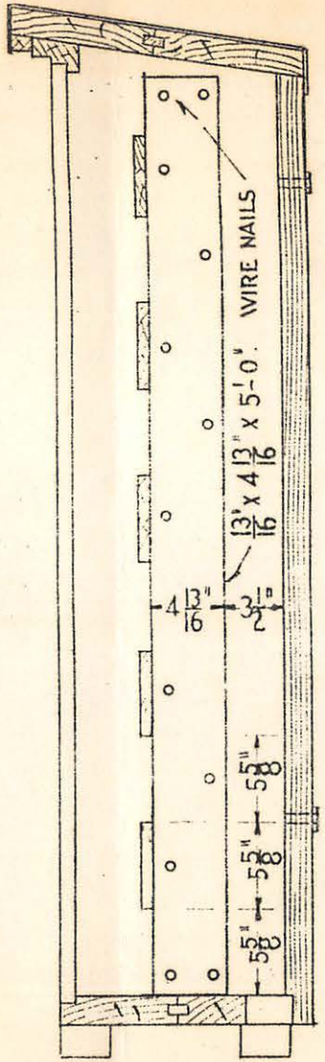
EMERGENCY BOARD ELECTRIC EQUIPMENT

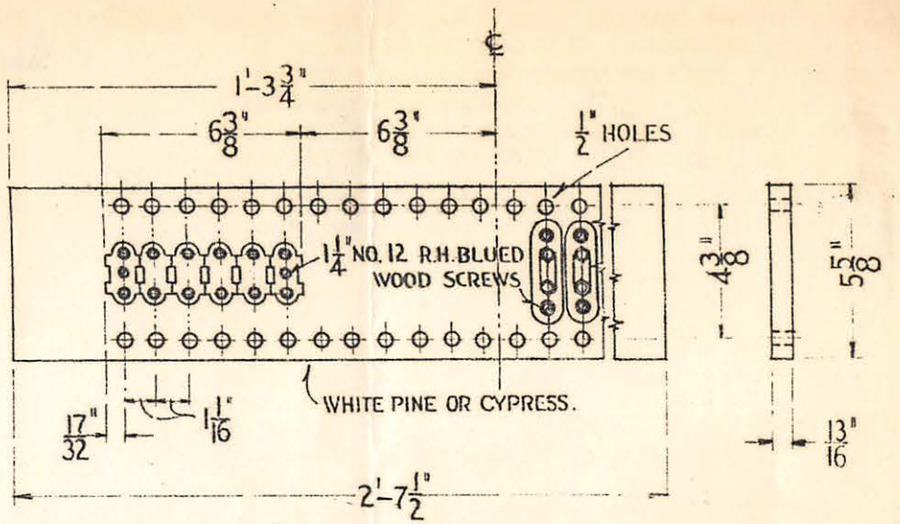
SEPT. 12, 1934

REVISION NO.		S-N8A

SIGNAL ENGINEER.







TERMINAL BOARD SHOWING DRILLING AND ARRANGEMENT OF TERMINALS.

P8D1 SIX WAY RELAY BOX P8B1, LESS FROST DOOR, DISTRIBUTING STRIPS, WOOD SCREWS FOR RELAYS AND REMOVABLE SHELF, COMPLETE WITH TERMINAL BOARD EQUIPMENT.

P8D2 SIX WAY RELAY BOX P8B2, LESS FROST DOOR, DISTRIBUTING STRIPS, WOOD SCREWS FOR RELAYS AND REMOVABLE SHELF, COMPLETE WITH TERMINAL BOARD EQUIPMENT.

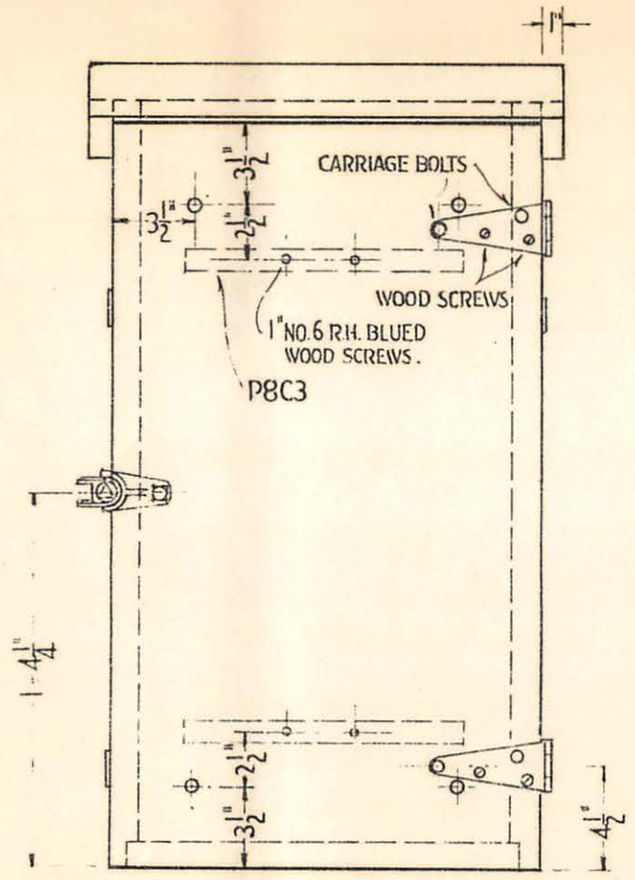
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

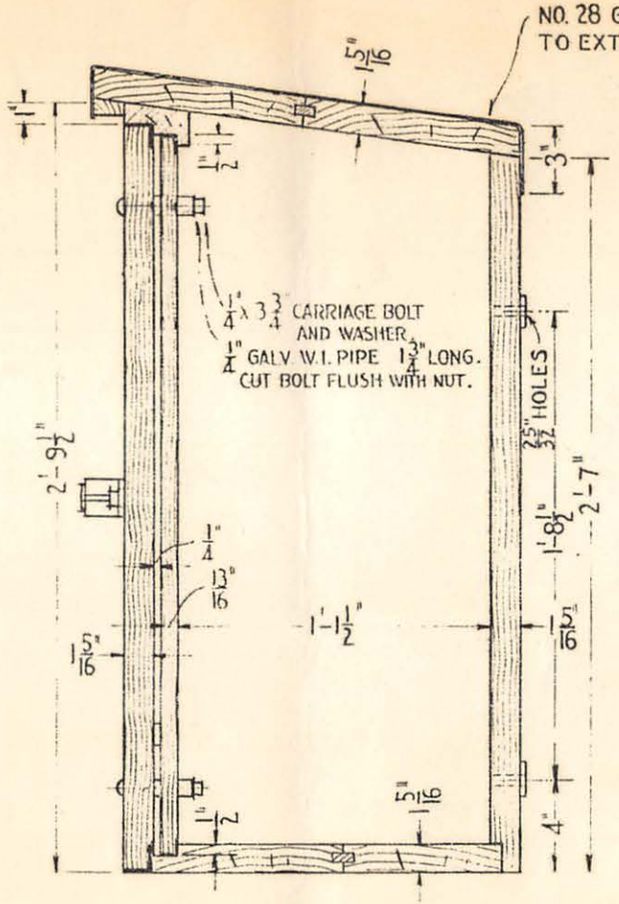
TERMINAL BOARD EQUIPMENT
SIX WAY RELAY BOX

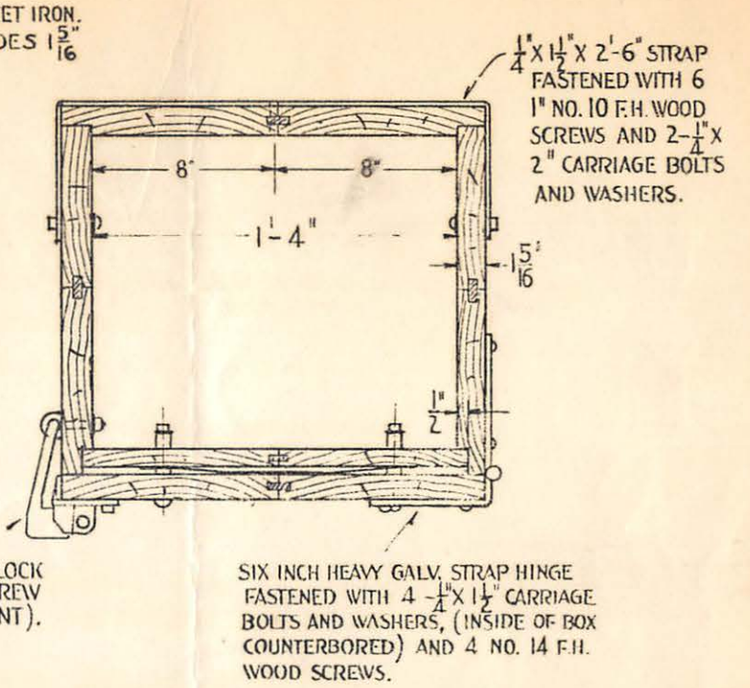
FEB. 14 -1935.

REVISION NO.		S-P8D

SIGNAL ENGINEER.




NO. 28 GAUGE GALV. SHEET IRON. TO EXTEND OVER SIDES 1 5/16"
1/4" X 3 3/4" CARRIAGE BOLT AND WASHER
1" GALV. W.I. PIPE 1 3/4" LONG. CUT BOLT FLUSH WITH NUT.
25/32" HOLES
2'-9 1/2"
2'-7"
1'-1 1/2"


1/4" X 1 1/2" X 2'-6" STRAP FASTENED WITH 6 1" NO. 10 F.H. WOOD SCREWS AND 2-1/4" X 2" CARRIAGE BOLTS AND WASHERS.
8"
8"
1'-4"
'RACO' DOOR LOCK WITH 'TRI' SCREW (OR EQUIVALENT).
SIX INCH HEAVY GALV. STRAP HINGE FASTENED WITH 4 -1/4" X 1 1/2" CARRIAGE BOLTS AND WASHERS, (INSIDE OF BOX COUNTERBORED) AND 4 NO. 14 F.H. WOOD SCREWS.

P9A1 – BOX AS SHOWN.

P9A2 – " " " EXCEPT WITH 'RACO' (OR EQUIVALENT) DOOR LOCK FOR PADLOCK.

NOTE: BOX SHALL BE CONSTRUCTED OF THOROUGHLY SEASONED WHITE PINE OR CYPRESS FREE FROM CHECKS AND LOOSE KNOTS, DRESSED FOUR SIDES AND NAILED WITH BARBED COMMON WIRE NAILS.
ALL JOINTS SHALL BE LAID IN AIRPLANE GLUE. KNOTS SHALL BE SHELLACKED BEFORE FIRST COAT OF PAINT IS APPLIED.
INTERIOR SHALL BE PAINTED TWO COATS OF GREY PAINT, EXTERIOR TWO COATS OF FORMULA 'F' PAINT.
WHEN PAINTING OR SPRAYING MACHINE IS USED, THREE COATS SHALL BE APPLIED.
FROST BOARD AND DOOR SHALL BE REINFORCED ON ENDS WITH SHEET STEEL ANGLES 3/4" X 3/4" X 1/16" X 1'-5" AND 1 1/4" X 1 1/4" X 1/16" X 1'-6 1/2" RESPECTIVELY, FASTENED TO FROST BOARD WITH NO. 8 - 5/8" AND TO DOOR WITH NO. 10 F.H. WOOD SCREWS, SCREW HEADS FLUSH WITH ANGLES.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

TERMINAL BOX

JAN. 28-1935

REVISION NO.		S-P9A

SIGNAL ENGINEER.

THE NEW YORK CENTRAL RAILROAD COMPANY

Signal Department

Cleveland, Ohio, March 7th, 1934.

File 554

WIRES AND CABLES

USES, ORDERING REFERENCES, AND WIRING DETAILS

1. Underground Track and Inductor Connections.

Ordering Reference:

Signal conductor, rubber insulated, 601-750 volt, non-metallic trench cable, N.Y.C. R.R. Electrical Department Specification 376.

..... Ft. No. 8 AWG 19 strand (for inductors)
..... Ft. No. 6 AWG solid (for track relay connections and track shunts)
..... Ft. No. 10 AWG solid (for track battery connections)

2. Underground Runs Without Ducts.

(a) Ordering Reference:

Multiple conductor, rubber insulated, 601-750 volt, non-metallic sheather trench cable, N.Y.C. R.R. Electrical Department Specification 379.

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand
..... conductors No. 10 AWG 7 strand
..... conductors No. 12 AWG 7 strand
..... conductors No. 14 AWG 7 strand

Conductors of proper gauge for 110 to 440 volt signal power circuits may be included.

(b) When authorized by Signal Engineer Parkway cable may be used.

Ordering Reference:

Multiple conductor, rubber insulated, 601-750 volt, lead covered and steel taped Parkway cable, N.Y.C. R.R. Electrical Department Specification 393.

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand
..... conductors No. 10 AWG 7 strand
..... conductors No. 12 AWG 7 strand
..... conductors No. 14 AWG 7 strand

Conductors of proper gauge for 110 to 440 volt signal power circuits may be included.

3. Underground Runs With Ducts.

Ordering Reference:

Multiple conductor, rubber insulated, 601-750 volt, lead covered cable, N.Y.C. R.R. Electrical Department Specification 327.

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand
..... conductors No. 10 AWG 7 strand
..... conductors No. 12 AWG 7 strand
..... conductors No. 14 AWG 7 strand

Conductors of proper gauge for 110 to 440 volt signal power circuits may be included.

4. Aerial Cable Runs or Temporary Work on the Surface of the Ground.

Ordering Reference:

Multiple conductor, rubber insulated, 601-750 volt, braid covered cable, N.Y.C. R.R. Electrical Department Specification 330.

..... Ft. ..... conductors consisting of
..... conductors No. 8 AWG 7 strand
..... conductors No. 10 AWG 7 strand
..... conductors No. 12 AWG 7 strand
..... conductors No. 14 AWG 7 strand

Conductors of proper gauge for 110 to 440 volt signal power circuits may be included.

5. 110 to 440 Volt Signal Power Circuits In Cable On Pole Line.

Ordering Reference:

(a) Twin conductor, rubber insulated, 601-750 volt, lead covered cable, N.Y.C. R.R. Electrical Department Sepcification No. 311.

WIRES AND CABLES

USES, ORDERING REFERENCES, AND WIRING DETAILS

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand

(b) Triple conductor, rubber insulated, 601-750 volt, lead covered cable, N.Y.C. R.R. Electrical Department Specification No. 386.

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand

Note:
When authorized by Signal Engineer braid covered cable N.Y.C. R.R. Electrical Department Specification No. 330 may be used. See No. 4 above.

6. Submarine Cable.

Ordering Reference:

Multiple conductor, rubber insulated, 601-750 volt, lead covered and armored submarine cable, N.Y.C. R.R. Electrical Department Specification No. 335.

..... Ft. ..... conductors consisting of
..... conductors No. 4 AWG 7 strand
..... conductors No. 6 AWG 7 strand
..... conductors No. 8 AWG 7 strand
..... conductors No. 10 AWG 7 strand
..... conductors No. 12 AWG 7 strand
..... conductors No. 14 AWG 7 strand

Conductors of proper gauge for 110 to 440 volt signal power circuits may be included.

7. Miscellaneous Outside Wiring.

Ordering Reference:

Single conductor, rubber insulated, 601-750 volt, signal wire, N.Y.C. R.R. Electrical Department Specification 320.

..... ft. No. 4 AWG strand, 500 to 1000 ft. per coil.
..... ft. No. 6 AWG solid, 1000 to 1350 ft. per coil.
..... ft. No. 8 AWG solid, 1500 to 2000 ft. per coil.
..... ft. No. 10 AWG solid, 1500 to 2000 ft. per coil.
..... ft. No. 12 AWG solid, 1500 to 2000 ft. per coil.
..... ft. No. 14 AWG solid, 1500 to 2000 ft. per coil.

WIRES AND CABLES
USES, ORDERING REFERENCES, AND WIRING DETAILS

8. Inside Wiring, Buildings, Boxes, etc. Where not Exposed to Weather

Note:

(a) No. 12 wire shall be used for wiring between entrance terminals and interlocking machine terminals for switch and derail control circuits where current requirements are less than 10 amperes.

(b) No. 14 wire shall be used for wiring between entrance terminals or lightning arresters and all other apparatus in relay boxes, relay houses and towers where current requirements are less than 10 amperes.

Where current is in excess of 10 amperes, gauge and kind of wire will be furnished under special instructions.

(c) No. 16 flexible wire specified for use at signal shop, in Paragraph 9, may be used for wiring electric lever locks on interlocking machines.

Ordering Reference:

Single conductor, rubber insulated, 0-600 volt, braided cable, N.Y.C.R.R. Electrical Department Specification 396.

.....ft. No. 14 AWG 7 strand 1000 to 1500 ft. per coil.
.....ft. No. 12 AWG 7 strand 1000 to 1500 ft. per coil.

9. For Use at Signal Shop.

Ordering Reference:

Single conductor, rubber insulated, 0-300 volt, weatherproof fixture wire, N.Y.C.R.R. Electrical Department Specification No. 392, except with black glazed braid.

..... ft. No. 16 AWG flexible 19 strand 1000 to 1500 ft. per coil
..... ft. No. 18 AWG flexible 19 strand 1000 to 1500 ft. per coil
..... ft. No. 18 AWG flexible 19 strand, except to have 1/64"rubber 1000 to 1500 ft.per coil.

10. Line Wire on Pole Lines.

Circuits less than 100 volts

Ordering Reference:

Double braided, weatherproof, thirty percent copper covered steel line wire, N.Y.C.R.R. Electrical Department Specification No. 403.

..... Miles of #10 AWG (Specify reels or coils)

Circuits for 110 to 440 volts

Ordering Reference:

Double braided, weatherproof solid copper line wire, N.Y.C.R.R. Electrical Department Specification No. 370.

..... Miles of #4 AWG (Specify reels or coils)
..... Miles of #6 AWG (Specify reels or coils)

WIRES AND CABLES
USES, ORDERING REFERENCES AND WIRING DETAILS

11. Miscellaneous. For conditions other than those mentioned above, special instructions will be issued.

(a) Where 600 volt armored cable for centralized traffic control circuits is used, it may include conductors of proper gauge for 440 volt signal power circuits.

(b) Where authorized for aerial use, in special cases, zinc armored Parkway cable may be used, N.Y.C. R.R. Electrical Department Specification No. .....

12. Terminating Cable Conductors.

(a) When each rubber insulated cable conductor is protected with a layer of friction tape or impregnated braid over the rubber insulation, the end of the insulation and covering for 1/2" shall be served with a piece of narrow friction tape and the conductor and tape shall then be painted with two coats of insulating paint.

(b) When each rubber insulated cable conductor is not protected with a layer of friction tape or impregnated braid, cotton sleeving of proper size shall be drawn over each rubber insulated conductor and the end of the sleeving and conductor next to the terminal shall be served with a piece of narrow friction tape for 1/2" and conductors and tape shall then be painted with two coats of insulating paint.

(c) The cotton sleeving ends next to the bunched conductors of the unspread cable must be made as uniform as possible and insulating paint must be applied before lacing or taping or forming the conductors. Such paint must be applied so it will run back inside of the cable jacket end and cover any short length of bare rubber not reached by the sleeving in order to exclude air from the rubber. After applying the paint in this way the form shall be closed and two layers of friction tape 1/2" lap shall be applied over the form starting one inch back on the cable jacket and extending out over the form one inch beyond the cable jacket.

(1) Sleeving.

Ordering Reference:

Anchor Webbing Company, Pawtucket, Rhode Island, or equivalent.

(a) For stranded conductors:
..... lbs. No. 9 sleeving (110 yards per lb.) for No. 14, No. 12, No. 10 wire.
..... lbs. No. 11 sleeving (60 yards per lb.) for No. 8 wire.
..... lbs. No. 12 sleeving (79 yards per lb.) for No. 6, No. 4 wire.

(b) For solid conductors:
..... lbs. No. 9 sleeving (110 yards per lb.) for No. 14, No. 12, No. 10 wire.
..... lbs. No. 10 sleeving (70 yards per lb.) for No. 8, No. 6 wire.

THE NEW YORK CENTRAL RAILROAD COMPANY

Signal Department

Cleveland, O., March 7,1934.
Rev. June 1,1934.
Sheet 6 of 6 sheets
File 554

WIRES AND CABLES
USES, ORDERING REFERENCES AND WIRING DETAILS.

13. Wires on Terminals.

Not more than one flat terminal conductor and two wires shall be placed on one binding post.

14. Installing Underground Cable Without Ducts.

Outside of tracks the cable shall be buried not less than 18 inches below top of ground

Crossing tracks the cable shall be buried not less than 18 inches below bottom of tie.

Cables shall be laid flat and parallel in trench. Where cinder or slag exists three inches of sand shall be placed around cables. Where there is a possibility of cables being damaged by subsequent excavations, cables shall be covered with rough 1 inch creosoted plank placed on top of three inches of earth covering over cables.

The ballast and shoulder must be replaced in a neat manner and where ties are undermined they shall be supported and after covering cable, properly tamped.

Standard cable markers placed flush with the surface of the ground shall be used to show the location of underground cables without ducts.

Signal forces shall confer with the Track Supervisor and Track Foreman regarding the digging of trenches, protecting excavations and back filling, doing this work in accord with standard requirements. If ballast beneath ties is disturbed, track men must be notified to retamp ballast.

Signal Engineer

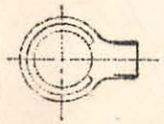
For Full Distribution.

W-2

JJC

X1A1 TERMINAL

RACO WIRE TERMINAL NO. 5282 OR EQUIVALENT
FOR TERMINATING NO. 16 A.W.G. FLEXIBLE CONDUCTORS.



X1A2 TERMINAL

NICKEL PLATED RACO BEE WIRE TERMINAL NO. 178-1
OR EQUIVALENT FOR TERMINATING NO. 14 A.W.G. STRANDED CONDUCTORS.

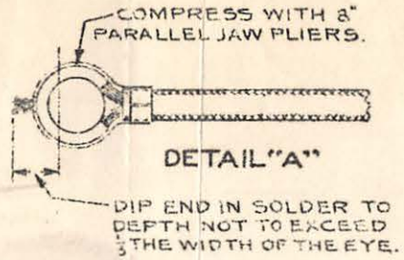
X1A3 TERMINAL

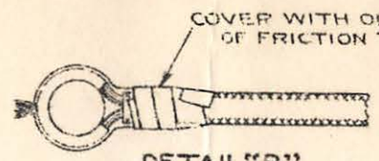
NICKEL PLATED RACO BEE WIRE TERMINAL NO. 178-2
OR EQUIVALENT FOR TERMINATING NO. 12 A.W.G. STRANDED CONDUCTORS.

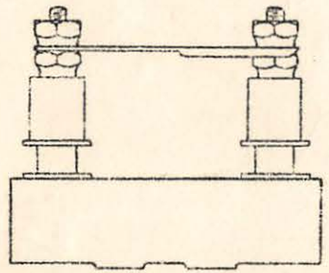
X1A4 TERMINAL

NICKEL PLATED RACO BEE WIRE TERMINAL NO. 178-3
OR EQUIVALENT FOR TERMINATING NO. 10 A.W.G. STRANDED CONDUCTORS.

APPLICATION OF TERMINALS X1A2, X1A3 AND X1A4

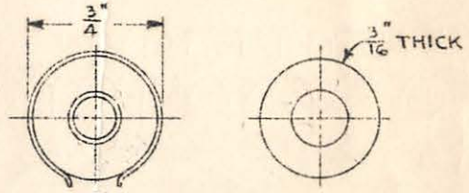






X1A5 TERMINAL

RACO SPLIT POST TERMINAL NO. 290 OR
EQUIVALENT FOR TERMINATING NO. 4 A.W.G.
SOLID OR STRANDED CONDUCTORS.



X1A6 TERMINAL

RACO CUP TERMINAL NO. 289 OR EQUIVALENT
FOR TERMINATING NO. 6 OR NO. 8 A.W.G.
SOLID OR STRANDED CONDUCTORS.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

WIRE TERMINALS

JAN. 10, 1934.

REVISION NO.		S-X1A

SIGNAL ENGINEER

AUG 22 1934
A. M.
NOTE
ATTENTION
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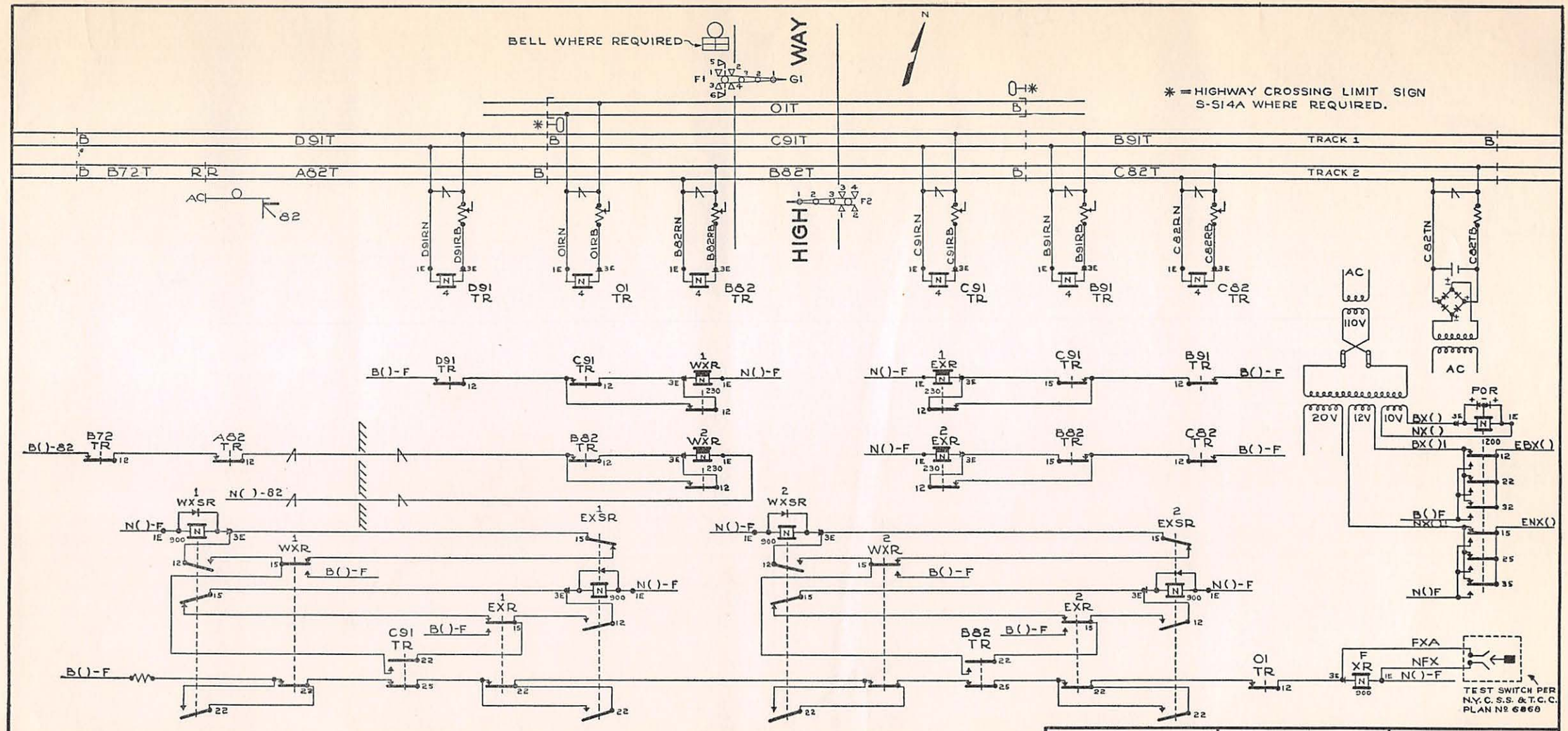
Date



N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.

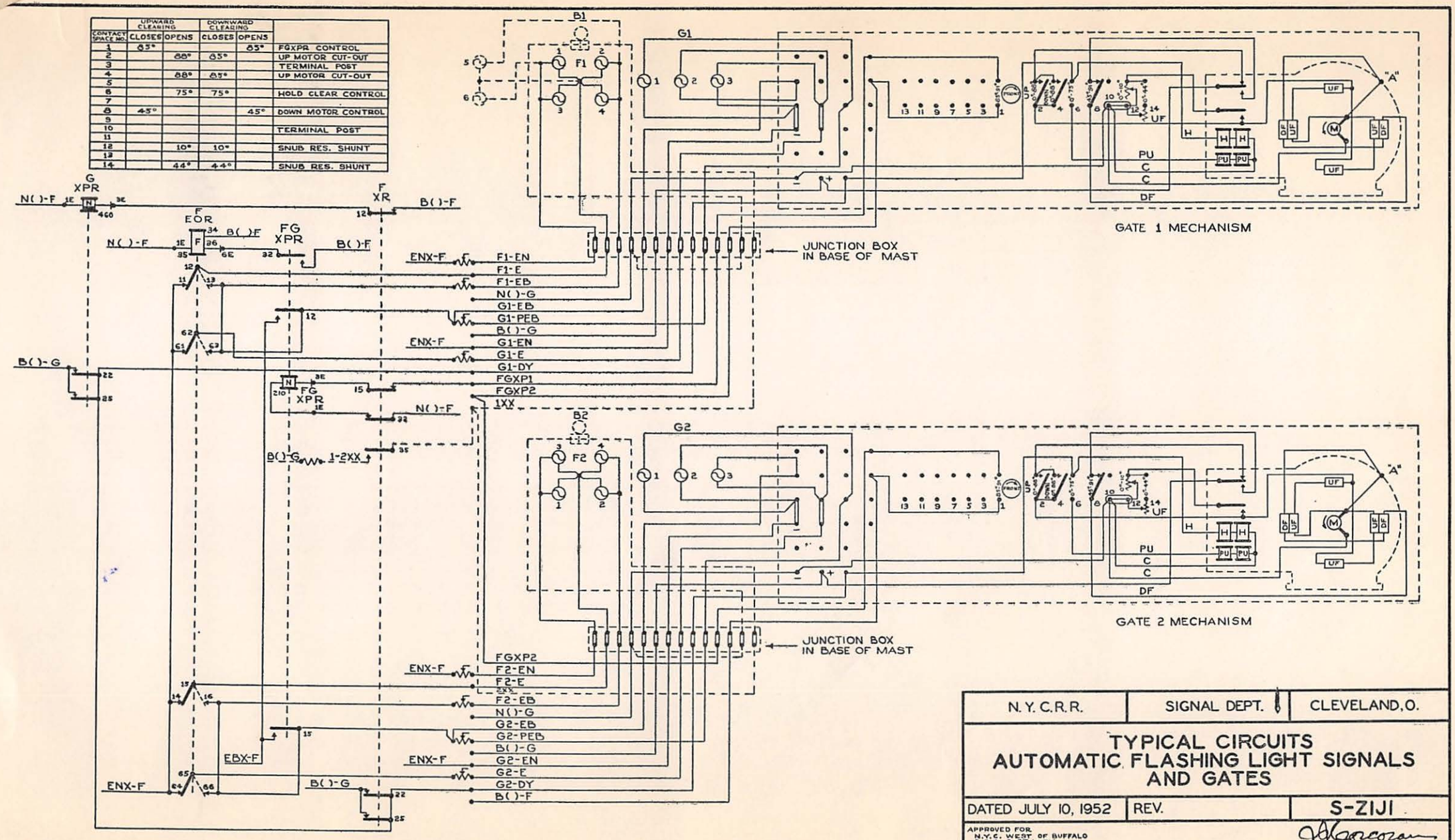
TYPICAL CIRCUITS AUTOMATIC FLASHING LIGHT SIGNALS AND GATES

DATED JULY 10, 1952	REV.	S-ZIJI

APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST.L. RY. M.C.R.R.

SIGNAL ENGINEER

CONTACT SPACE NO.	UPWARD CLEARING CLOSES	UPWARD CLEARING OPENS	DOWNWARD CLEARING CLOSES	DOWNWARD CLEARING OPENS	
1	85°			85°	FGXPR CONTROL
2		88°	85°		UP MOTOR CUT-OUT
3					TERMINAL POST
4		88°	85°		UP MOTOR CUT-OUT
5					
6		75°	75°		HOLD CLEAR CONTROL
7					
8	45°			45°	DOWN MOTOR CONTROL
9					
10					TERMINAL POST
11					
12		10°	10°		SNUB RES. SHUNT
13					
14		44°	44°		SNUB RES. SHUNT



N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.

TYPICAL CIRCUITS AUTOMATIC FLASHING LIGHT SIGNALS AND GATES

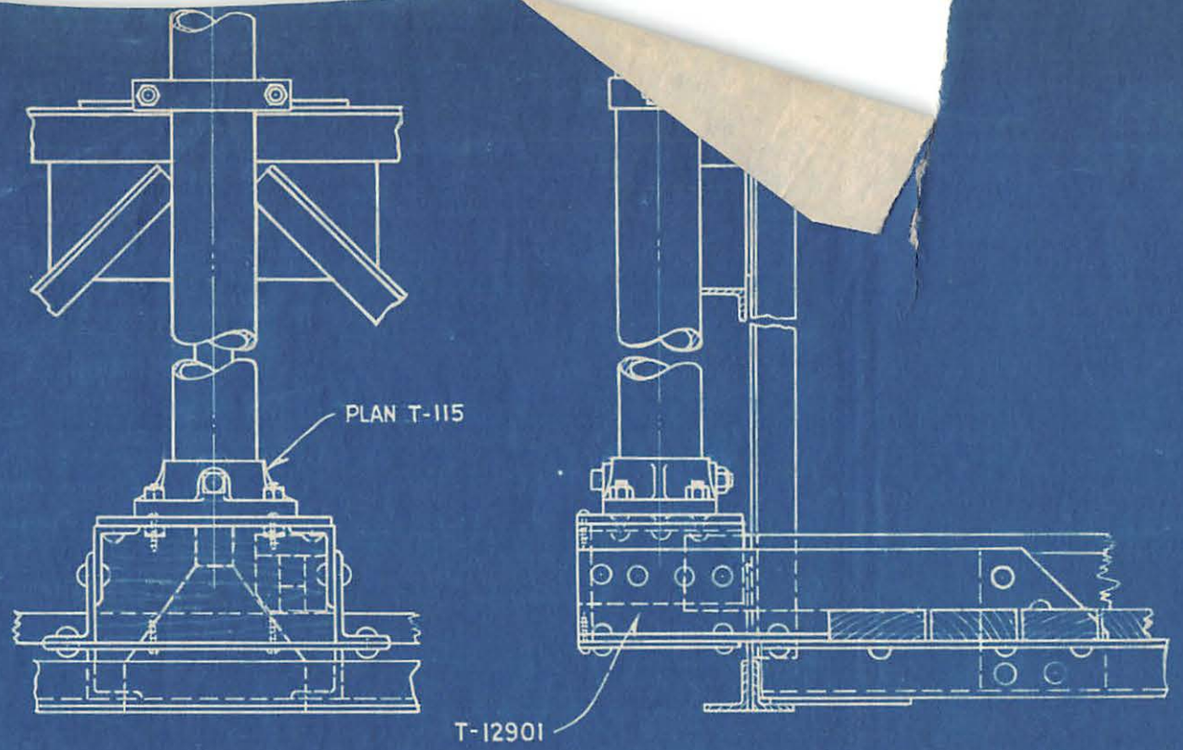
DATED JULY 10, 1952	REV.	S-ZIJI

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

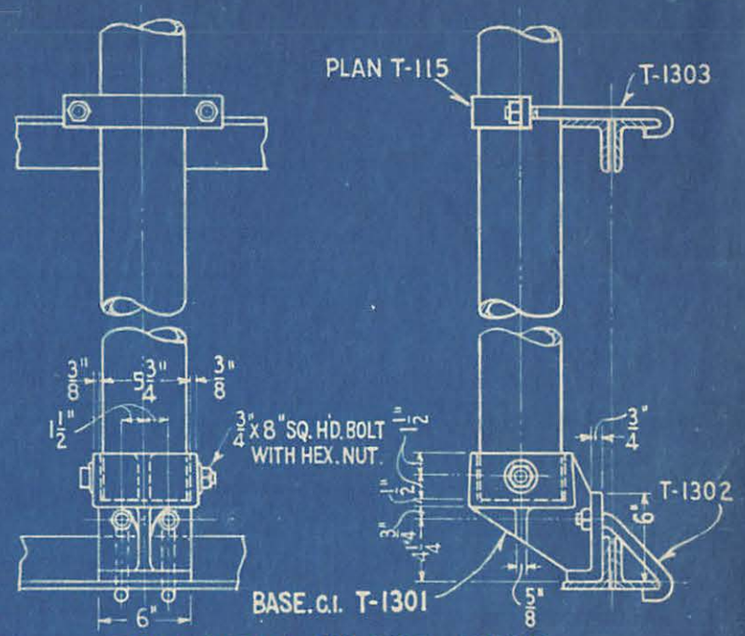
J. H. Corcoran
SIGNAL ENGINEER

SHEET 2 OF 2 SHEETS

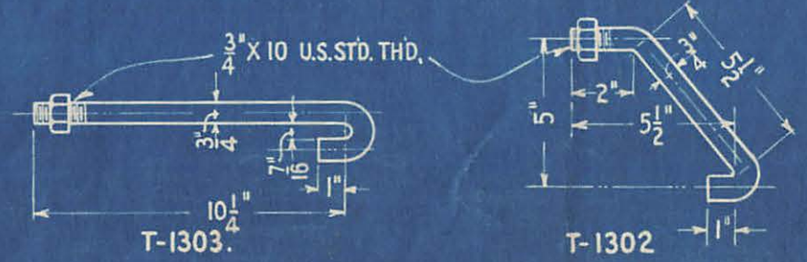
T-13
REV. 5



SIGNAL SUPPORT FOR SIGNAL BRIDGES
WITH SIX FT. DEPTH OF TRUSS OR OVER.



SIGNAL SUPPORT FOR SIGNAL BRIDGES
WITH FOUR OR FIVE FT. DEPTH OF TRUSS.



HOOK BOLTS. W.I. - 2 OF EACH REQ'D.
SCALE : 2" = 1'-0".

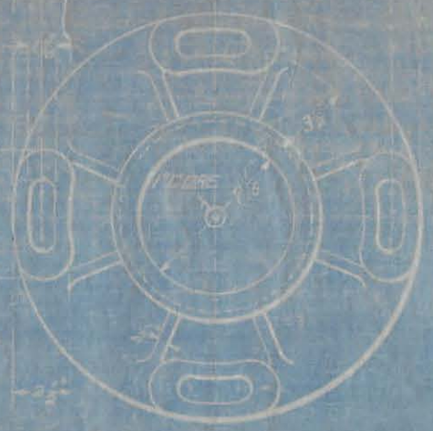
N. Y. C. R. R.

SIGNAL DEPT.

ARRANGEMENT OF BRIDGE SIGNAL SUPPORTS.

SCALE : 1" = 1'-0". ALBANY, AUG. 28 - 1918.

W. H. Elliott 9/1/18.
SIGNAL ENGINEER.



BASE
S.D.100 C.I.

CLAMP
S.D.101 C.I.

1 ARM SIGNAL ROD EYE
S.D. 148 W.I.

2 ARM SIGNAL ROD EYE
S.D. 149 W.I.

CAP.
S.D. 102 C.I.

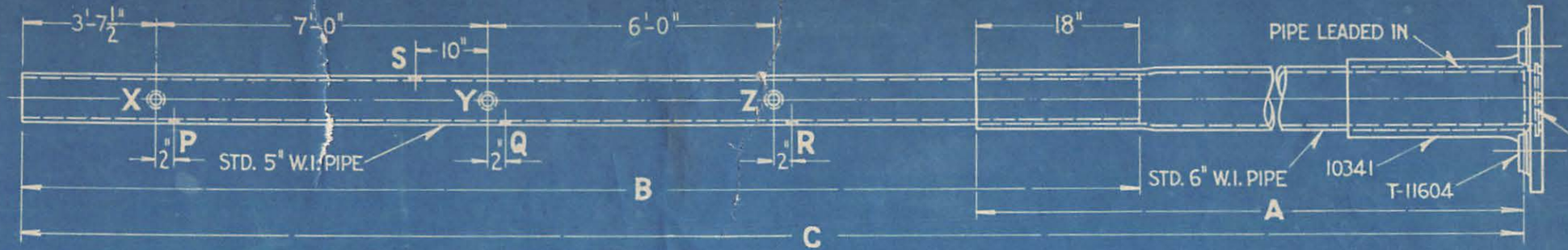
N.Y.C. & H.R.R.R.
STANDARD SIGNAL DETAILS.

A. Hardin, ENGR M OF W.
W.H. Elliott, ENGR OF SIGNALS.
[illegible], GEN'L SUPT.

R.O.L.S. 8-10-04

RECD
MAR
18
1916
THE U. S. & S.
SWISSVALE

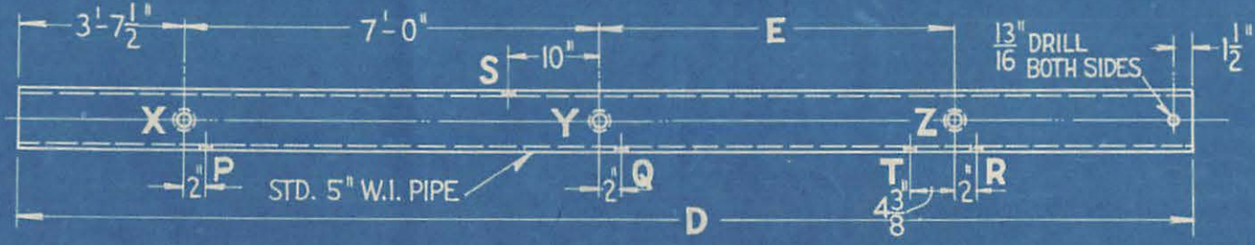
T-57
REV. 11
1-5-23



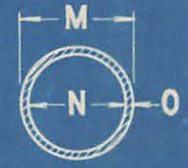
GROUND MASTS	SWAGED PIPE ONLY				DRILL AND PLUG HOLES	ASSEMBLY WITH 10341 T-11603 & T-11604
	A	B	C	ARA		
ONE AND TWO ARM				10358	X-Y-P-Q-S	T-5701
TWO ARM 32 FT.				10359	X-Y-P-Q-S	T-5702
THREE ARM	13'-9"	19'-9"	32'-0"		X-Y-Z-P-Q-R	T-5703
THREE ARM 38 FT.				103510	X-Y-Z-P-Q-R	T-5704

NOTE: HOLES X Y Z SHALL BE TAPPED AND FURNISHED WITH 1½" PIPE PLUGS.
HOLES P Q R S T SHALL BE TAPPED AND FURNISHED WITH 1" PIPE PLUGS.

OUTSIDE SURFACE OF MASTS SHALL BE GIVEN A PRIMING COAT OF RED LEAD AND LINSEED OIL, FORMULA 'E' PAINT, AND TWO COATS BLACK, FORMULA 'F' PAINT, SPEC. Z-42..
INSIDE SURFACE OF MASTS SHALL BE GIVEN A HEAVY COAT OF TAR APPLIED WHILE HOT.



BRIDGE AND BRACKET MASTS	PIPE ONLY			DRILL AND PLUG HOLES	REF. NO.
	D	E	ARA		
ONE ARM BRIDGE AND T-145	10'-6"			X-P-S	T-5705
TWO AND THREE ARM BRIDGE	17'-6"	6'-6"		X-Y-Z-P-Q-S-T	T-5706
ONE AND TWO ARM BRACKET			10352	X-Y-P-Q-S	T-5707
THREE ARM BRACKET	19'-0"	6'-0"		X-Y-Z-P-Q-R	T-5708
DUMMY MAST			10351		



W = WEIGHT IN LBS. PER FT.

NOMINAL DIMENSIONS				
PIPE	M	N	O	W
5"	5.563"	5.047"	.258"	14.61
6"	6.625"	6.065"	.280"	18.97

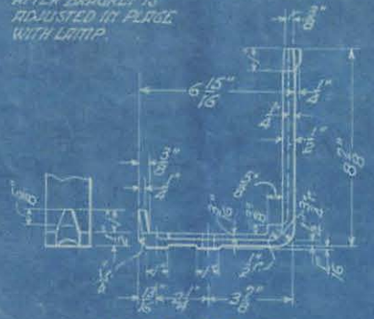
NOTE: PERMISSIBLE VARIATION IN WEIGHT IS 5%.

N. Y. C. R. R.
SIGNAL DEPARTMENT.
SIGNAL MASTS.
NOT TO SCALE. - NEW YORK, SEPT. 8-1904.

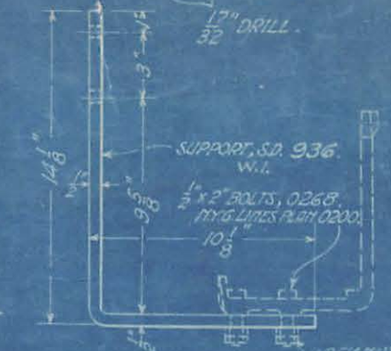
W. H. Elliott 7/22/22
SIGNAL ENGINEER.

T-114
REV. 6

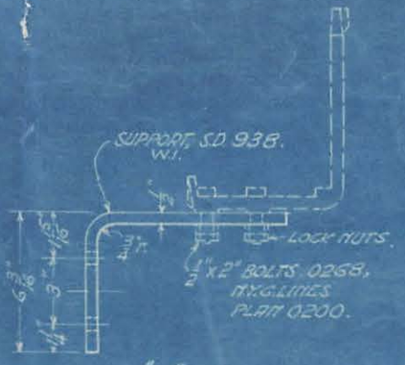
3-23-15



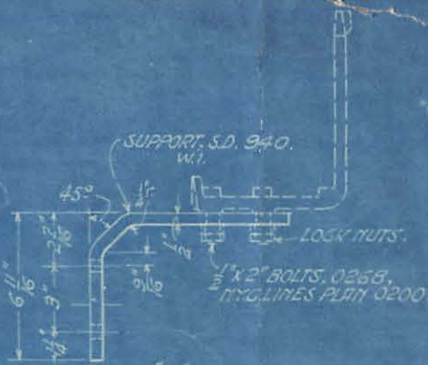
LAMP BRACKET, M.I.
AS PER R.S.M. PLAN 1049, EXCEPT DRILLING AS NOTED.
S.D. 920.



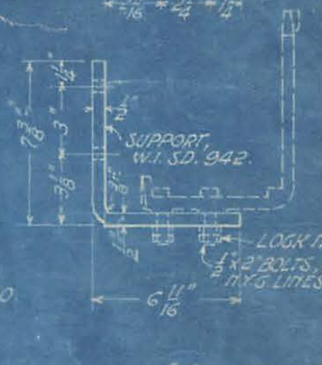
FOR MECHANICAL SIGNAL.
COMPLETE WITH BRACKET, S.D. 937.
TO BE USED WITH BEARING S.D. 935, PLAN T-152.



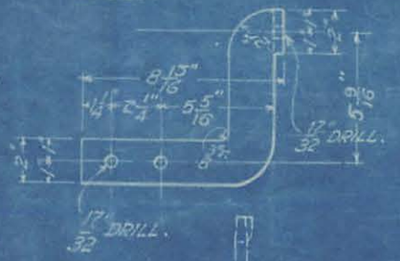
FOR STYLE "H" TOP POST SIGNAL.
COMPLETE WITH BRACKET, S.D. 939.

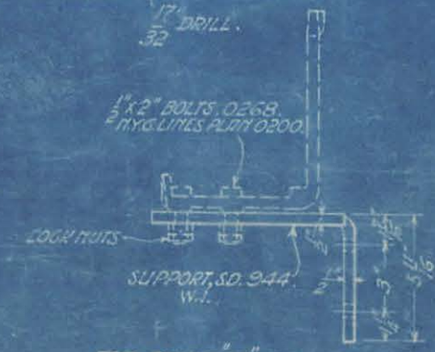


FOR STYLE "K" TOP CLAMP SIGNAL.
COMPLETE WITH BRACKET, S.D. 941.

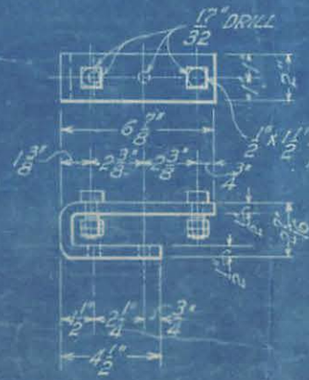


FOR STYLE "K" SIDE CLAMP SIGNAL.
COMPLETE WITH BRACKET, S.D. 943.





FOR STYLE "K" SIDE CLAMP SIGNAL.
COMPLETE WITH BRACKET, S.D. 945
TO BE USED WITH SPECTACLE S.D. 895, PLAN T-149.



LAMP BRACKET, M.I. S.D. 919.
FOR ELECTRIC SIGNAL LAMP
AS PER PLAN X-161.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

LAMP BRACKETS AND SUPPORTS, UPPER QUADRANT SIGNALS.

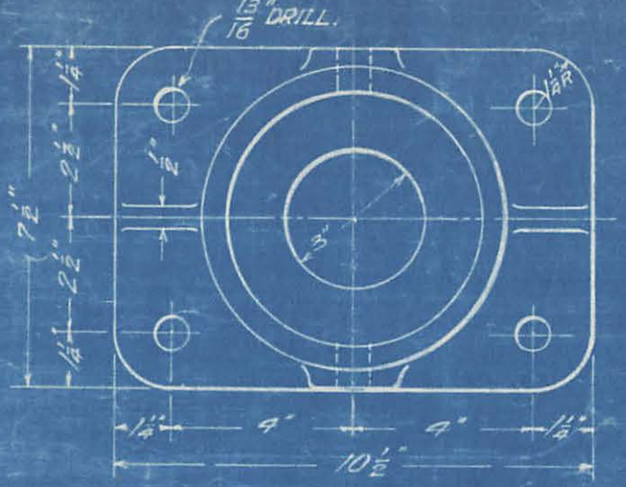
SCALE: 1 1/2" = 1'-0" ALBANY, AUG. 8TH 1914.

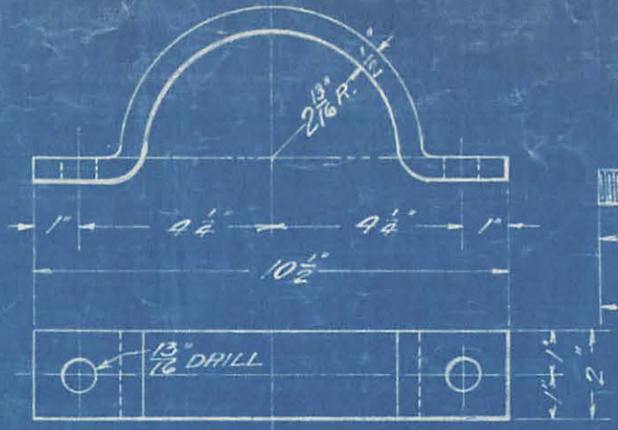
W. H. Elliott 8/31/14
SIGNAL ENGINEER.

RECD
APR
23
1915

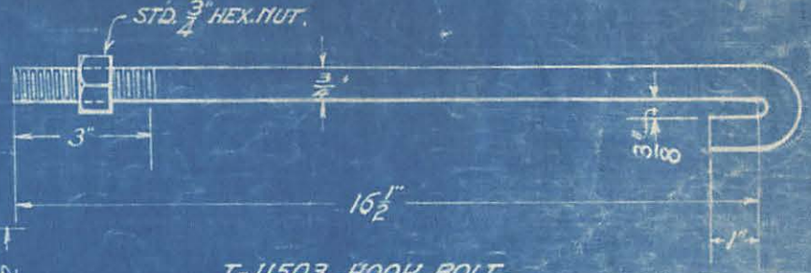
T-115
REV. #2

5-28-18

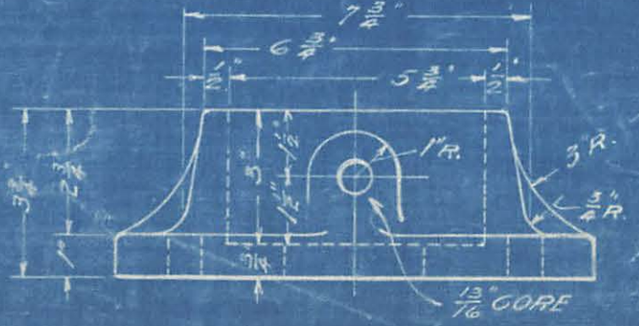




T-11504, CLAMP, W.I.
T-11505. CLAMP WITH HOOK BOLTS.



T-11503, HOOK BOLT.
2 REQ'D.



T-11501, BASE CASTING. C.I.
T-11502, BASE WITH 3/4" X 8 1/2" SQ. HD. BOLT & HEX. NUT.

NOTE: FOR T-11502, 4- 3/4" X 2 3/4" SQ. HD. BOLTS & HEX. NUTS ARE REQ'D. EXCEPT IN CASE OF THREE ARM SIGNAL BOTTOM ARM POWER OPERATED WHERE BOLTS SHALL BE AS PER PLAN T-128.

N.Y.C.R.R.

SIGNAL DEPT.

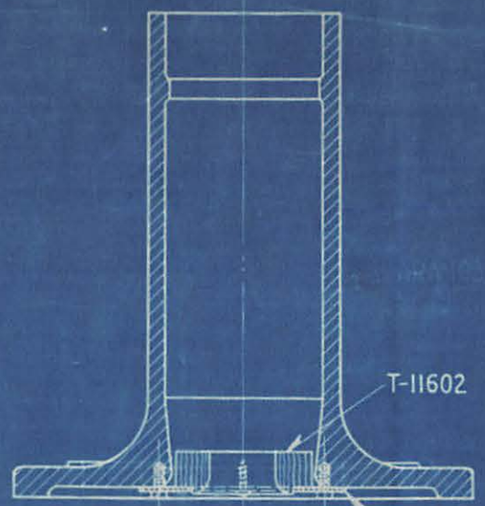
SUPPORTS FOR BRIDGE MASTS.

SCALE: 3"=1'-0" NEW YORK, APRIL 20-09.

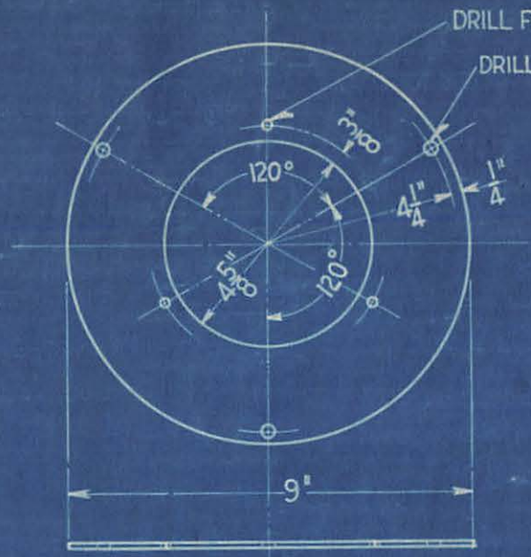
W.H. Elliott. 4/20/09.

SIGNAL ENGINEER.

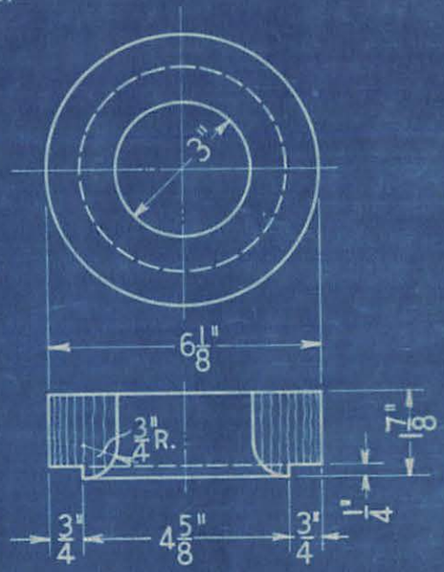
T-116
REV. 3



ASSEMBLY

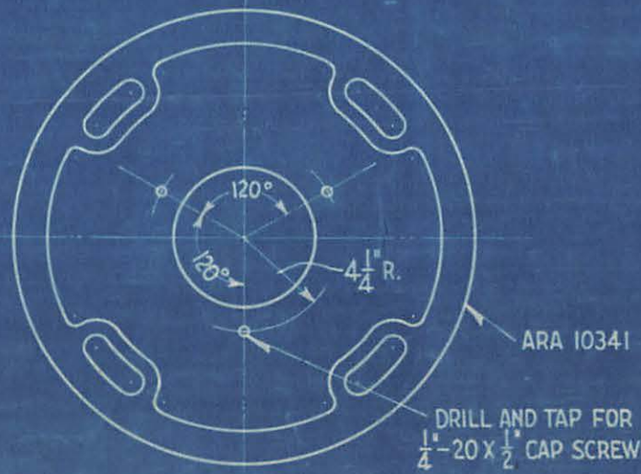


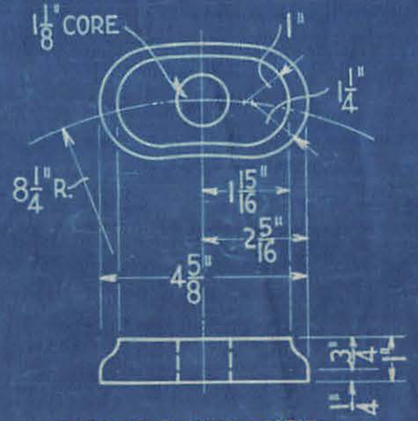
T-11601 INSULATOR SUPPORT,
NO. 11 U.S.STD. GAUGE SHEET IRON.
1 REQ'D.



T-11602 INSULATOR,
HEART YELLOW PINE - 1 REQ'D.

T-11603 INSULATOR AND SUPPORT,
WITH 3 1/4"-20 X 1/2" CAP SCREWS
AND 3 NO. 8 X 1 1/4" R.H. WOOD SCREWS.





T-11604 WASHER, C.I.
4 REQ'D.

N. Y. C. R. R.
SIGNAL DEPARTMENT

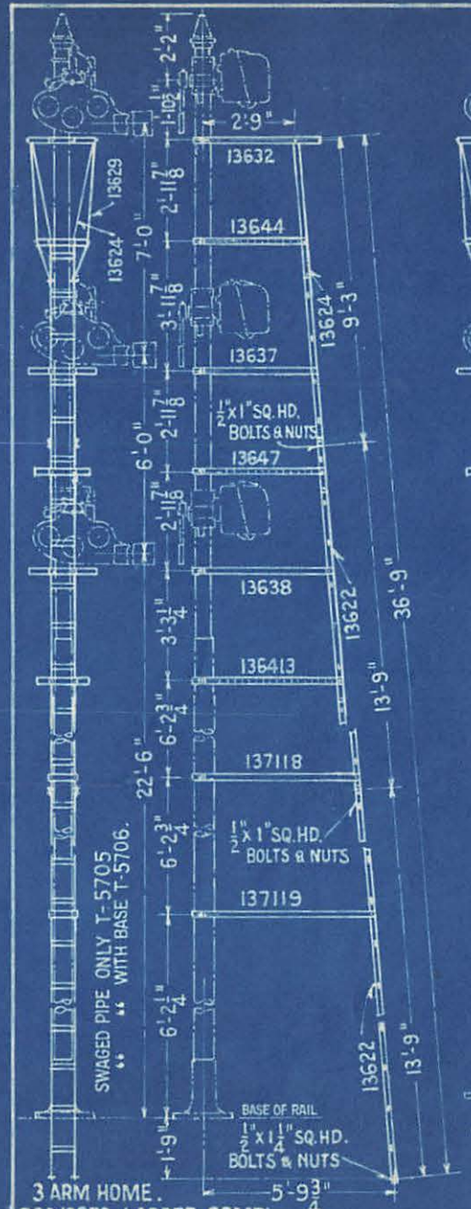
INSULATOR AND WASHER
GROUND SIGNAL BASE

SCALES: 1 1/2" & 3" = 1'-0" ALBANY, JUNE 4-1908.

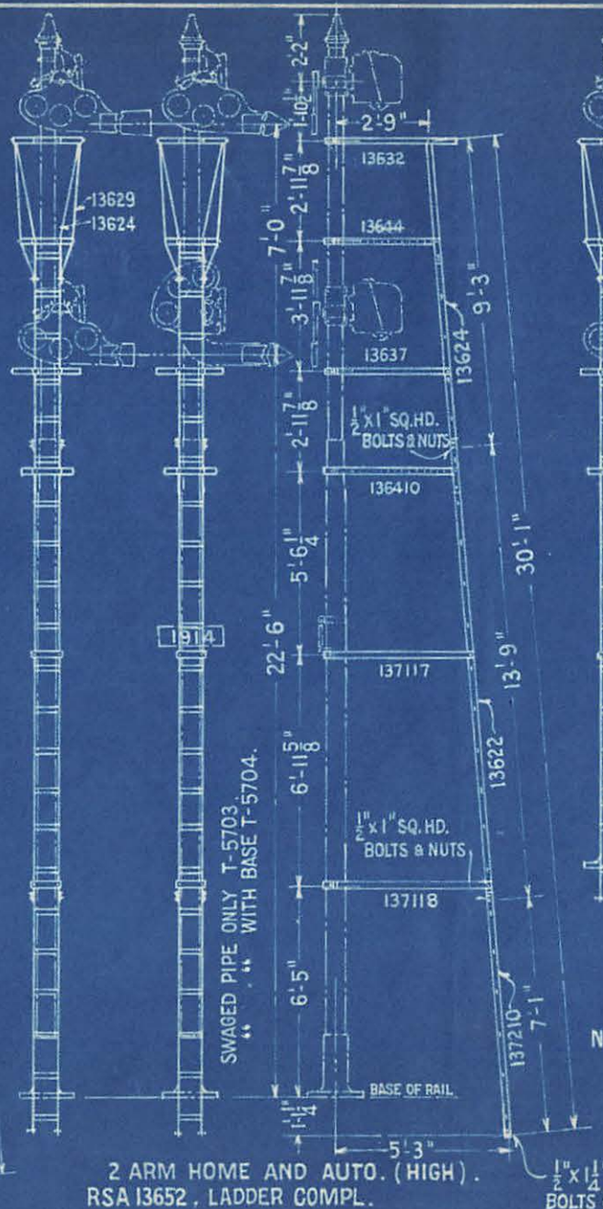
W. H. Elliott 9/21/21.
SIGNAL ENGINEER.

T-117
REV. 3

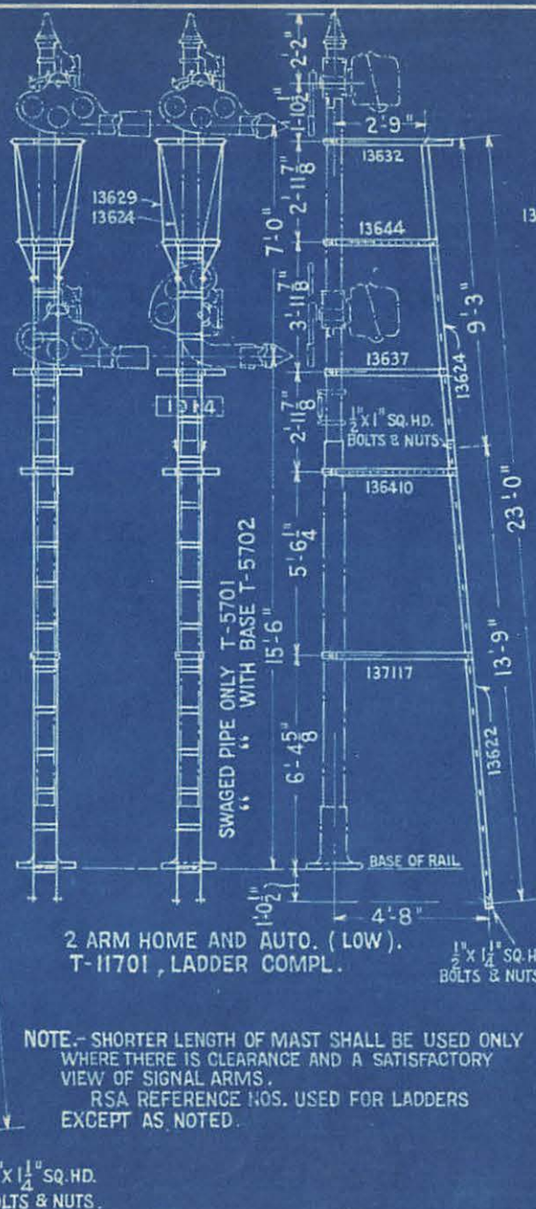
6-29-18



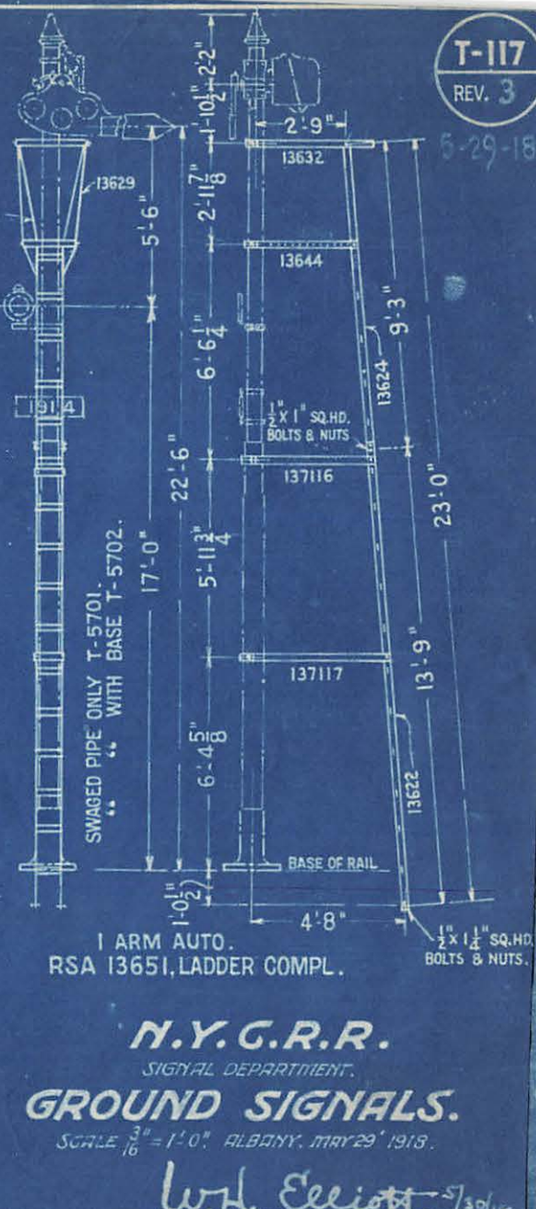
3 ARM HOME.
RSA 13653, LADDER COMPL.



2 ARM HOME AND AUTO. (HIGH).
RSA 13652, LADDER COMPL.



2 ARM HOME AND AUTO. (LOW).
T-11701, LADDER COMPL.



1 ARM AUTO.
RSA 13651, LADDER COMPL.

NOTE.- SHORTER LENGTH OF MAST SHALL BE USED ONLY WHERE THERE IS CLEARANCE AND A SATISFACTORY VIEW OF SIGNAL ARMS.
RSA REFERENCE NOS. USED FOR LADDERS EXCEPT AS NOTED.

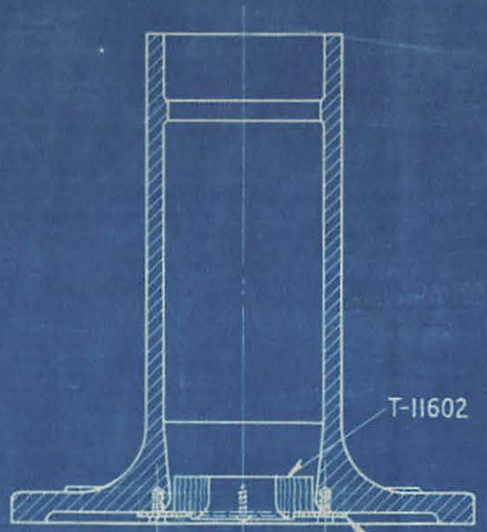
N.Y.G.R.R.
SIGNAL DEPARTMENT.

GROUND SIGNALS.

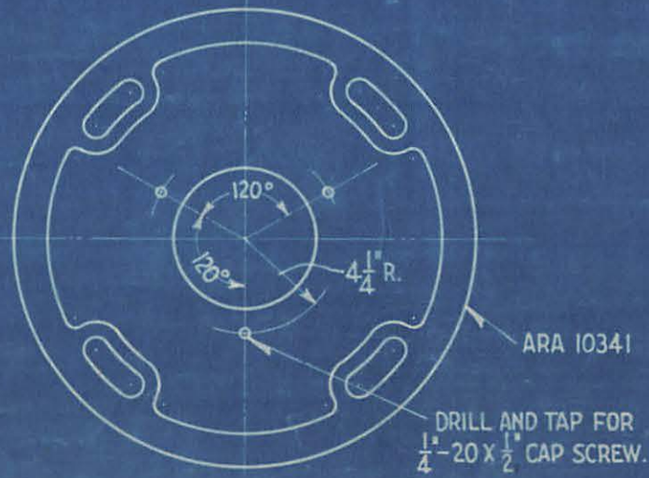
SCALE 3/16" = 1'-0". ALBANY, MAY 29, 1918.

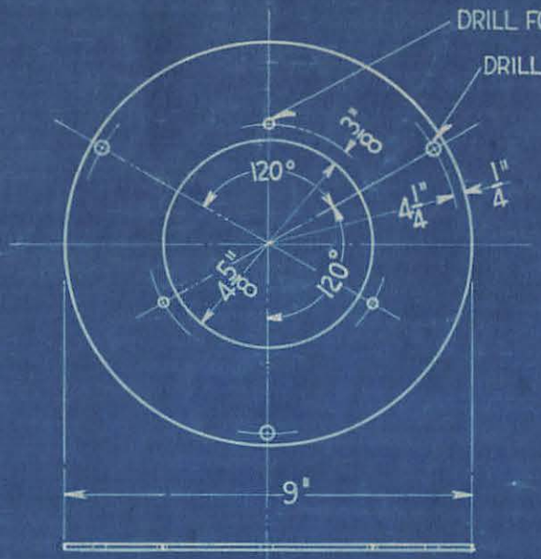
W. H. Elliott 5/30/18.
SIGNAL ENGINEER.

T-116
REV. 5

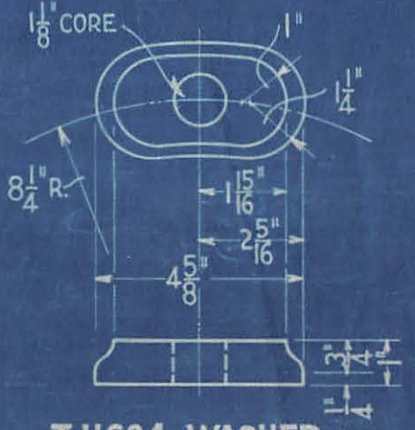


ASSEMBLY

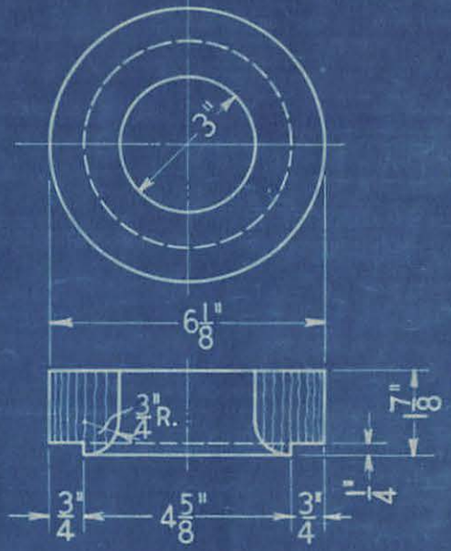




T-11601 INSULATOR SUPPORT,
NO. 11 U.S.STD. GAUGE SHEET IRON.
1 REQ'D.



T-11604 WASHER, C.I.
4 REQ'D.



T-11602 INSULATOR,
HEART YELLOW PINE - 1 REQ'D.

T-11603 INSULATOR AND SUPPORT,
WITH 3 1/4"-20 X 1/2" CAP SCREWS
AND 3 NO. 8 X 1 1/4" R.H. WOOD SCREWS.

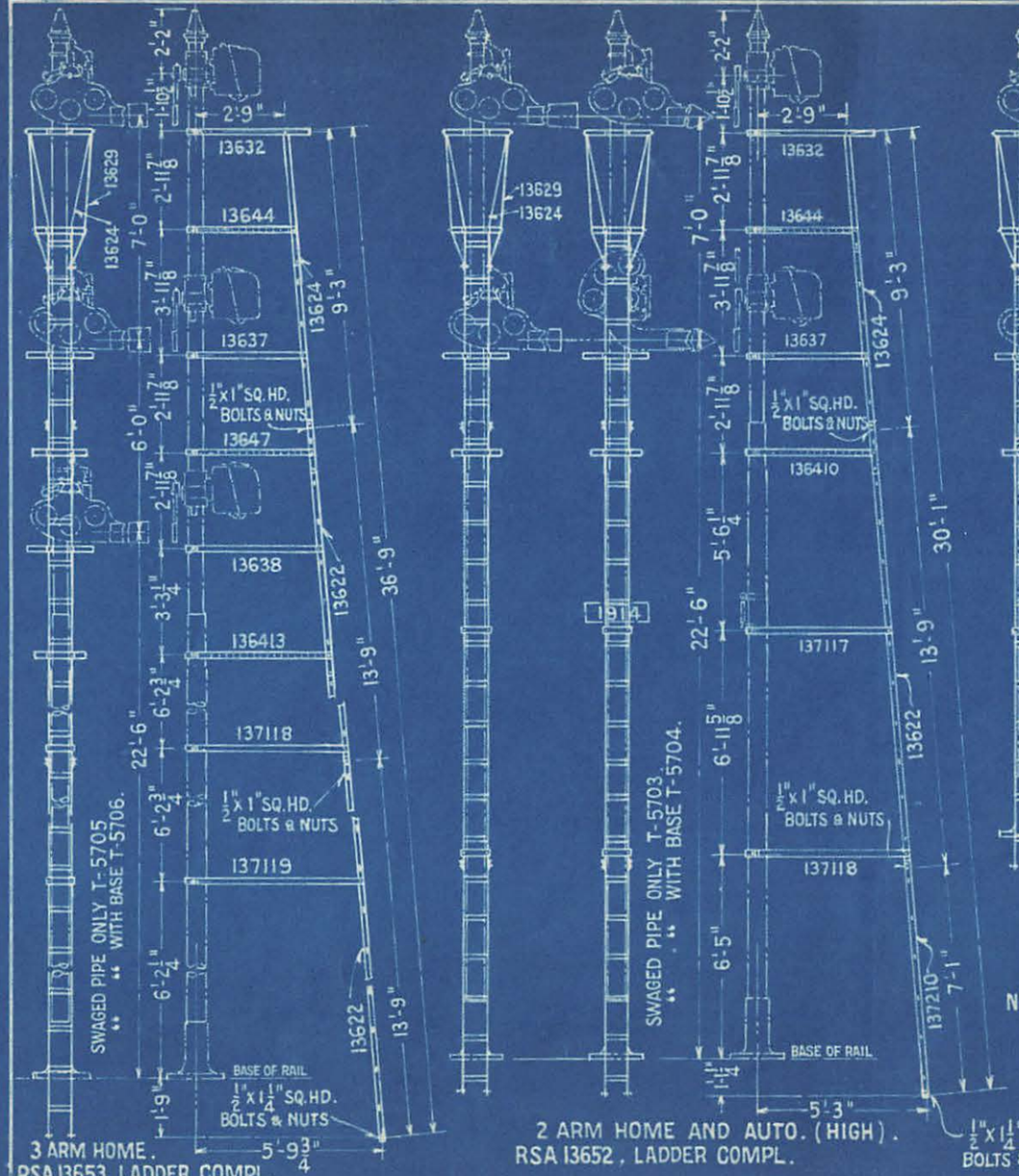
N. Y. C. R. R.
SIGNAL DEPARTMENT

INSULATOR AND WASHER
GROUND SIGNAL BASE

SCALES: 1 1/2" & 3" = 1'-0". ALBANY, JUNE 4-1908.

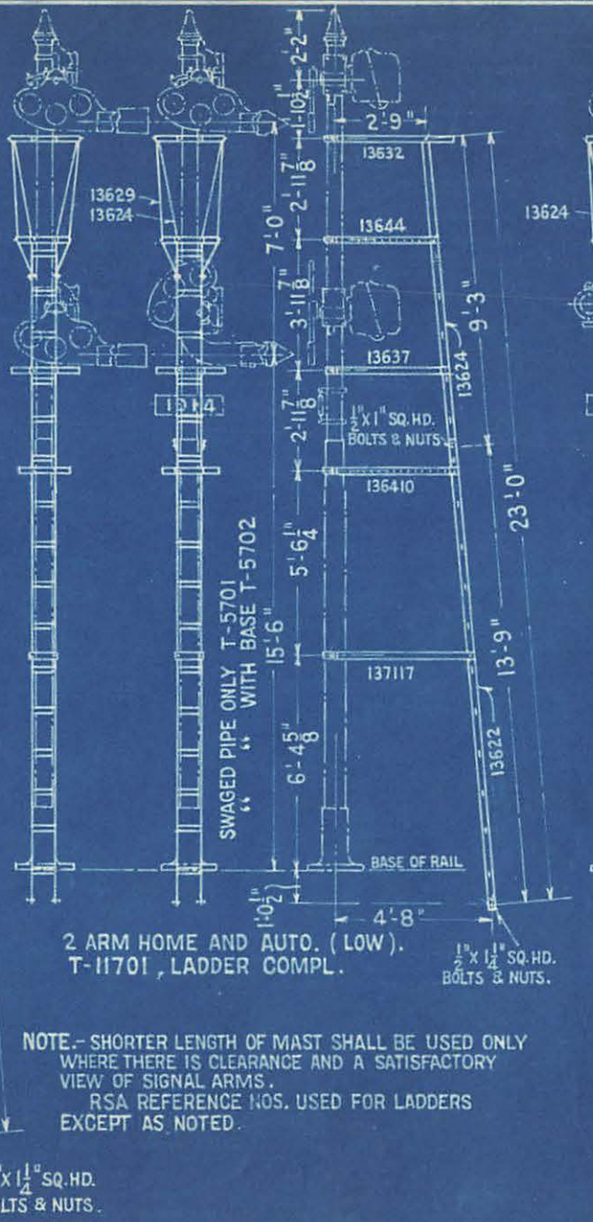
W. H. Elliott 9/21/21
SIGNAL ENGINEER.

T-117
REV. 3
5-29-18

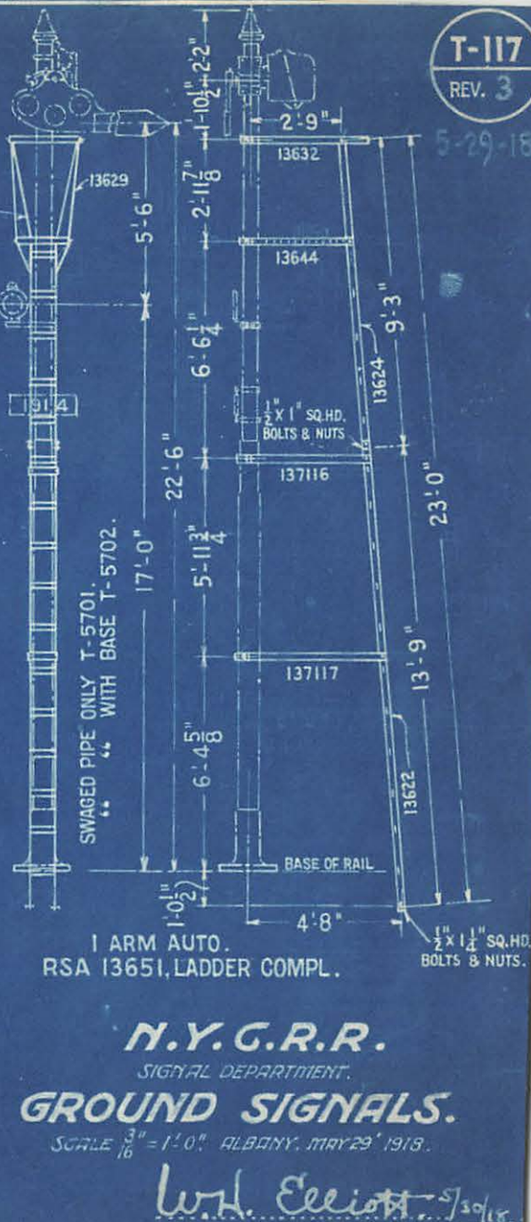


3 ARM HOME.
RSA 13653, LADDER COMPL.

2 ARM HOME AND AUTO. (HIGH).
RSA 13652, LADDER COMPL.



2 ARM HOME AND AUTO. (LOW).
T-11701, LADDER COMPL.



1 ARM AUTO.
RSA 13651, LADDER COMPL.

NOTE.- SHORTER LENGTH OF MAST SHALL BE USED ONLY WHERE THERE IS CLEARANCE AND A SATISFACTORY VIEW OF SIGNAL ARMS.
RSA REFERENCE NOS. USED FOR LADDERS EXCEPT AS NOTED.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

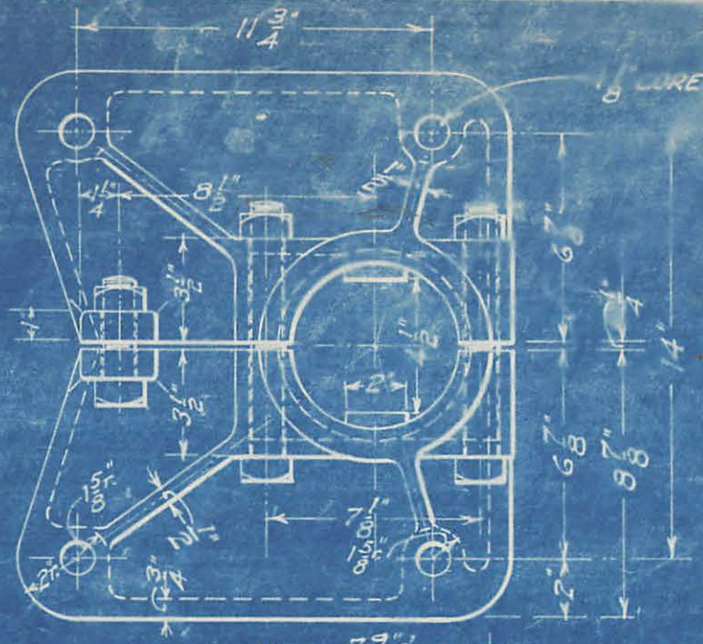
GROUND SIGNALS.

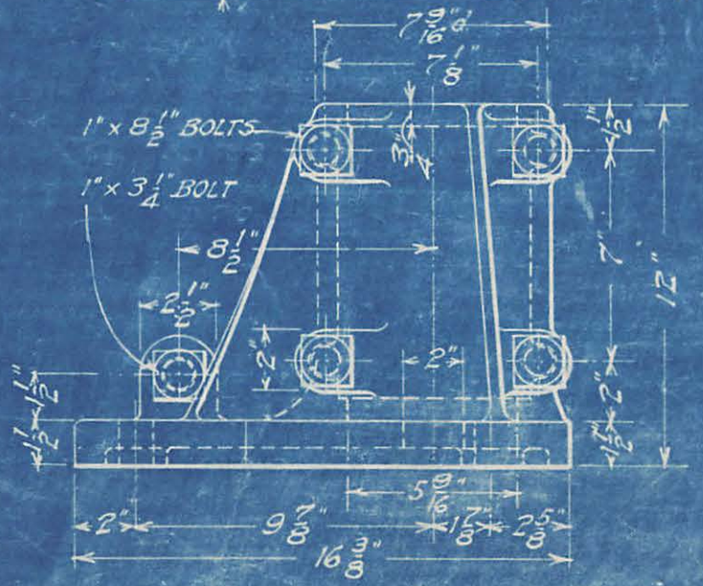
SCALE 3/16" = 1'-0" ALBANY, MAY 29, 1918.

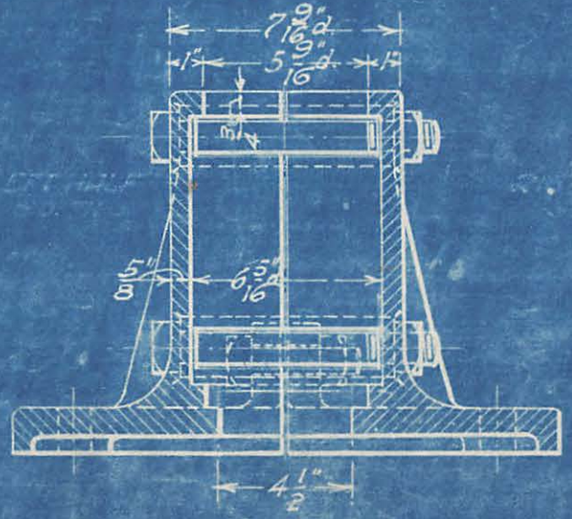
W. H. Elliott 5/30/18.
SIGNAL ENGINEER.

T-118
REV. 1

5-28-10







BASE COMPL.
T-11801

NOTE: THIS BASE FOR N.Y.C. TYPE BRACKET POST ONLY.

N. Y. C. R. R.

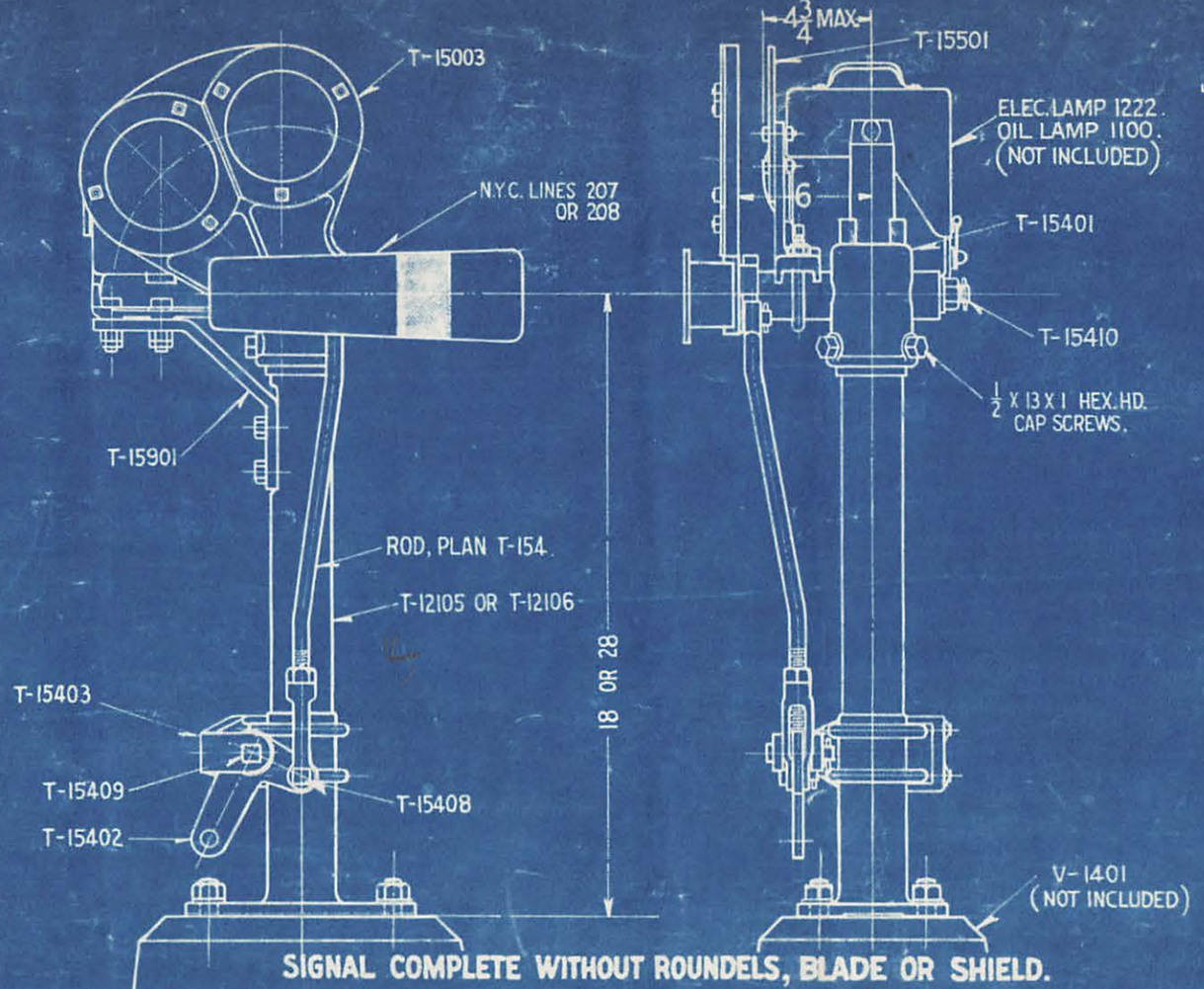
SIGNAL DEPT.

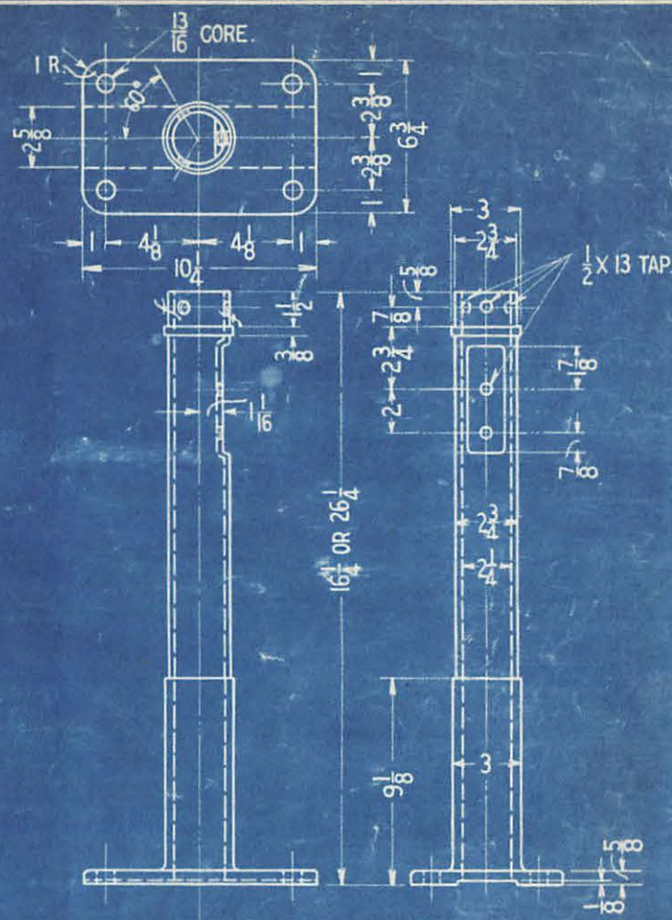
BASE FOR BRACKET MAST.

SCALE: 2"=1'. ALBANY. JUNE 10-09.

W. H. Elliott 6/19/09.
SIGNAL ENGINEER.

T-121
REV. 8
1-8-25





T-12105, 16 ¼ IN. STAND. C.I.
T-12106, 26 ¼ IN. "

SIGNAL COMPLETE WITHOUT ROUNDELS, BLADE OR SHIELD.

T-12101, ASSEMBLY 18 IN. SIGNAL FOR CROSS LEAD.
T-12102 " 28 " " " " "
T-12103 " 18 " " " PARALLEL LEAD.
T-12104 " 28 " " " " "

NOTE: 28 IN. SIGNAL SHALL BE USED AT LOCATIONS OUTSIDE OF TRACKS AND WHERE TRACK CENTERS ARE 13 FT. OR OVER.
18 IN. SIGNAL SHALL BE USED AT ALL OTHER LOCATIONS.

0 1 2 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES.

N. Y. C. R. R.

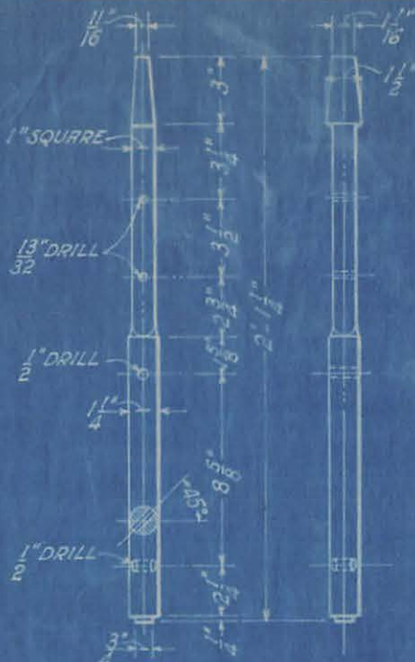
SIGNAL DEPARTMENT

UPPER QUADRANT DWARF SIGNAL

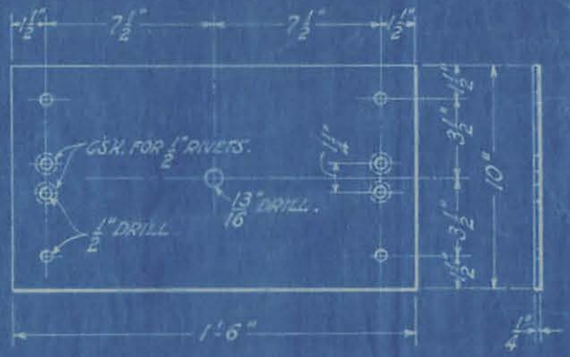
ALBANY, JUNE 22-1914.

W. H. Elliott 10/7/22.
SIGNAL ENGINEER.

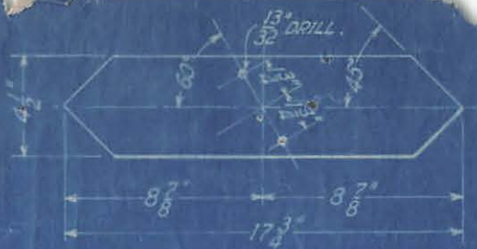
7-7-15



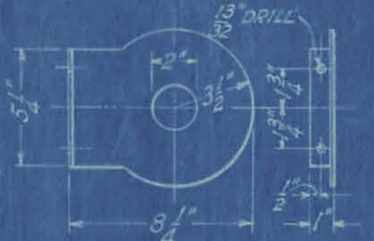
SHAFT, W.I. S.D. 754.
1 REQUIRED.



BASE PLATE, STEEL. S.D. 753.
1 REQUIRED.



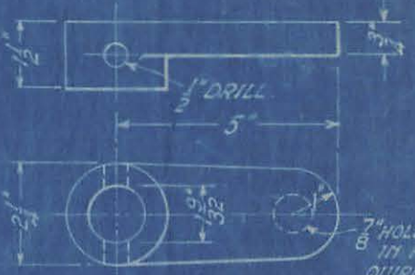
NO. 12 B.&S. GAUGE PLATE STEEL.
PLATE, S.D. 1030.
1 REQUIRED.



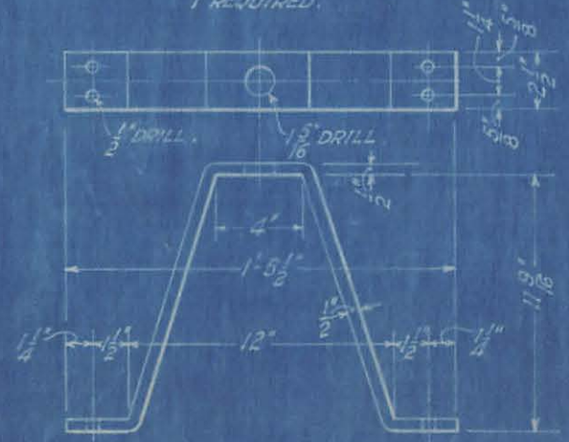
NO. 12 B.&S. GAUGE PLATE STEEL.
PLATE, S.D. 1031.
2 REQUIRED.

PIN, G.R.S. S.D. 769.
2 REQUIRED.

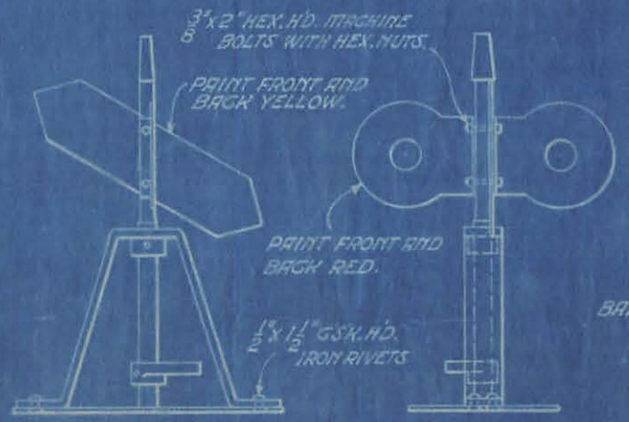
COLLAR, W.I. S.D. 756.
1 REQUIRED.



CRANK W.I. S.D. 755.
1 REQUIRED.



SUPPORT, W.I. S.D. 1032.
1 REQUIRED.



DERAIL TARGET COMP. S.D. 752.

BANNER ASSEMBLY.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

DERAIL TARGET.

SCALES: 1", 1/2" & 3 1/2" TO 1'. ALBANY, JULY 7th 1915.

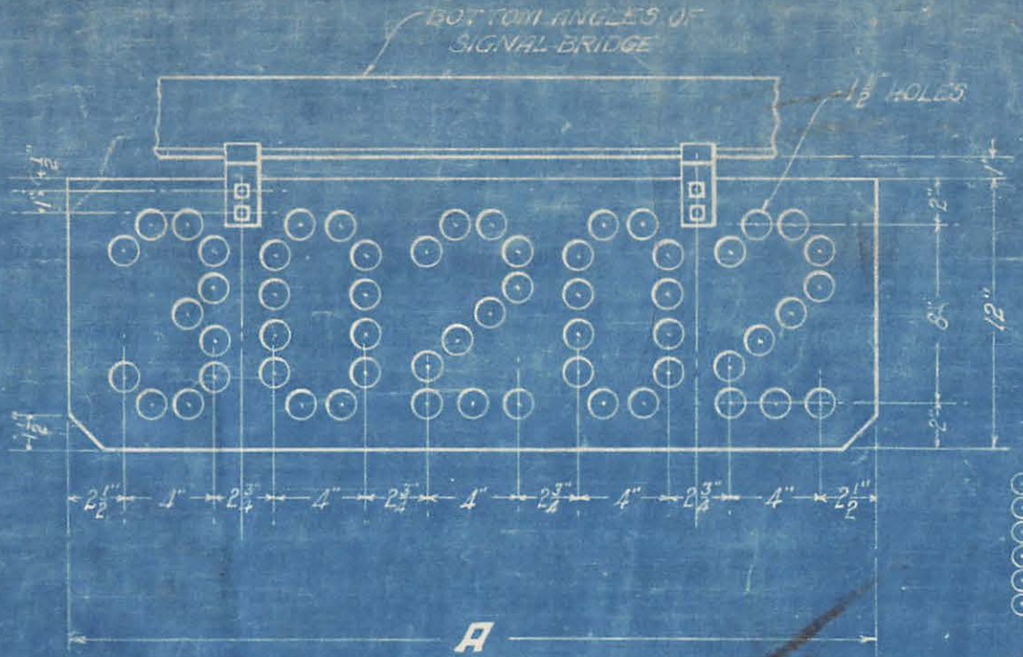
W.H. Elliott 7/10/15

SIGNAL ENGINEER.

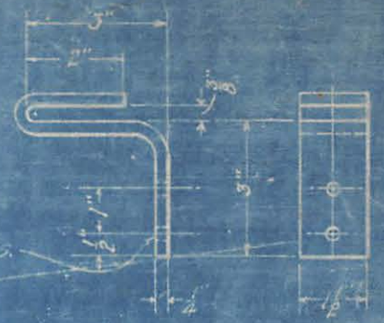
RECEIVED
MAR 17 1916

REC'D
MAR
18
1916

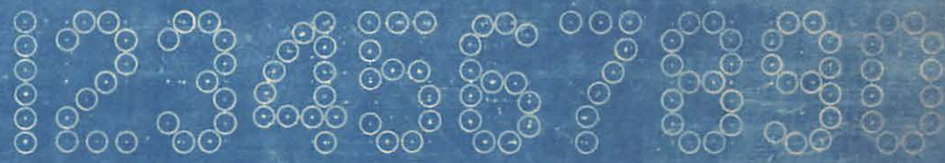
T-120



NUMBER OF FIGURES	DIM. A
3	22½"
4	29¼"
5	36"



STRAP.
W. I. 4 WANTED.



NOTE:-
THE MILEAGE SYSTEM IS TO BE USED IN NUMBERING AUTOMATIC SIGNALS. THE LAST NUMERAL OF THE NUMBER IS TO INDICATE THE TRACK GOVERNED BY THE SIGNAL, AND THE PRECEDING NUMERALS THE DISTANCE IN MILES AND TENTHS OF A MILE FROM TERMINAL.
FIGURES MUST BE PROPERLY SPACED ON EACH PLATE.
CLAMPS TO BE LOCATED BETWEEN THE TWO OUTSIDE FIGURES IN ALL CASES.

N. Y. C. & H. R. R. R.

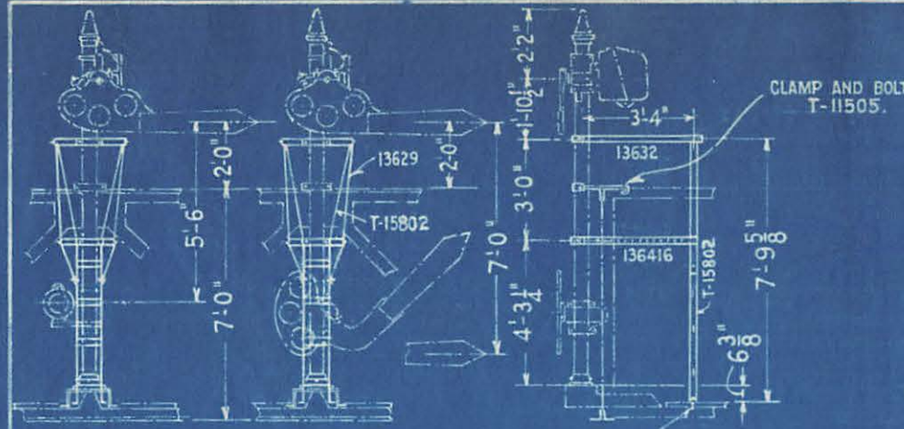
SIGNAL DEPARTMENT.

NUMBER PLATE FOR SIGNAL BRIDGES.

SCALES 1½" & 3" = 1'-0" ALBANY MARCH 22-1912

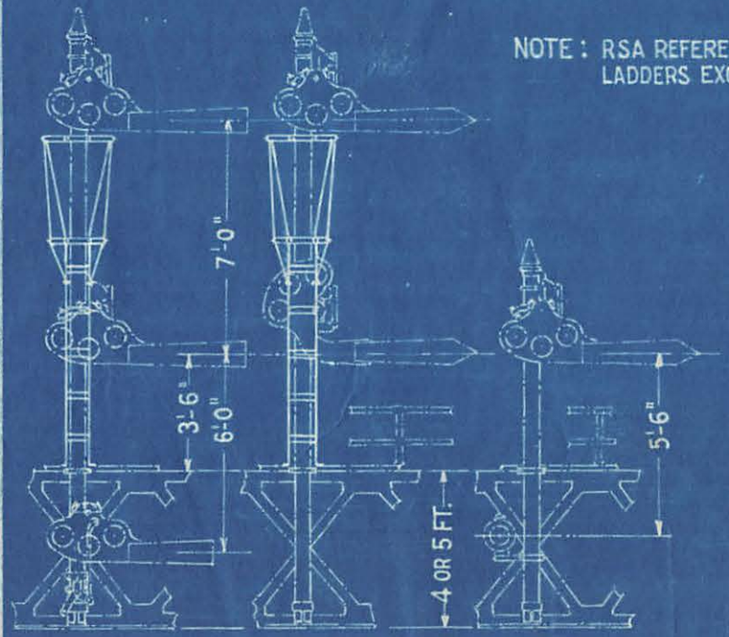
W. J. Elliott. 3/22/12.
SIGNAL ENGINEER.

T-128
REV. 6



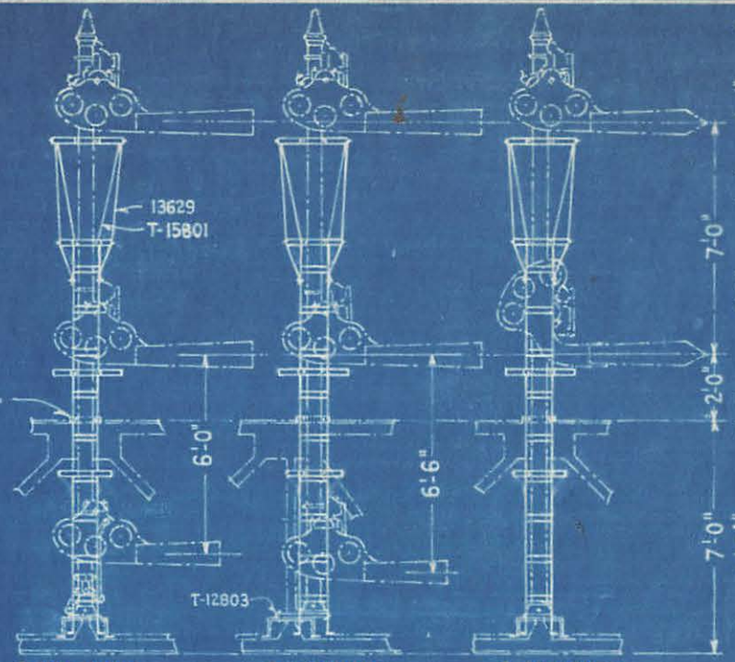
1 ARM AUTO. PERMISSIVE

T-5707, PIPE.
T-12801, LADDER COMPL.



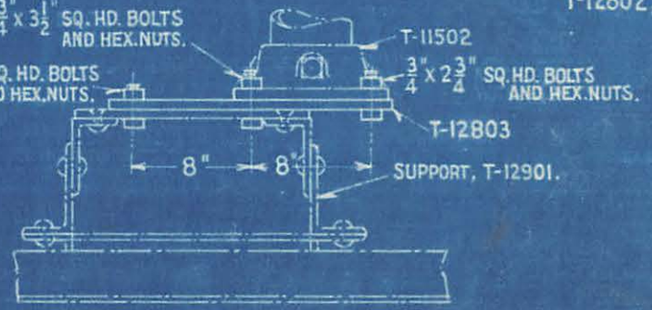
3 ARM HOME LADDER RSA 13661 MAY BE USED. 2 ARM AUTO. 1 ARM AUTO.

NOTE: RSA REFERENCE NOS. USED FOR LADDERS EXCEPT AS NOTED.



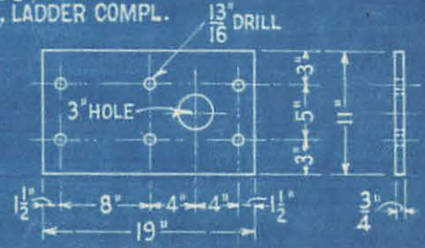
3 ARM HOME BOTTOM ARM MECHANICAL. 3 ARM HOME BOTTOM ARM POWER. 2 ARM AUTO.

T-5708, PIPE.
T-12802, LADDER COMPL.



SUPPORT FOR 3 ARM SIGNAL WHERE BOTTOM ARM IS POWER OPERATED.

SCALE: 1" = 1'-0"



T-12803, PLATE, STEEL.

SCALE: ¾" = 1'-0"

N.Y.C.R.R.

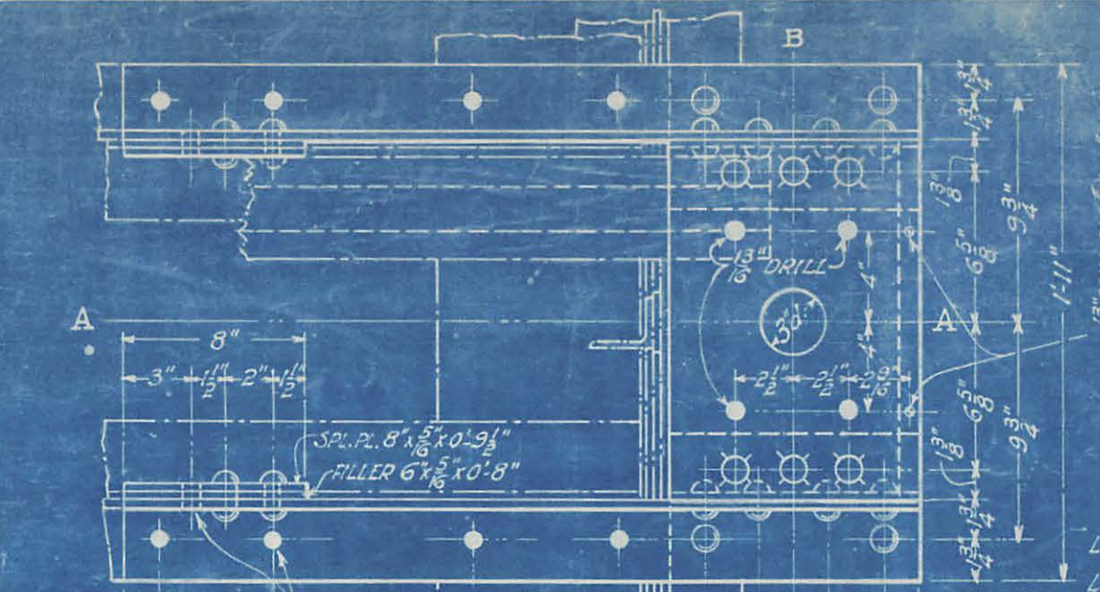
SIGNAL DEPARTMENT.

BRIDGE SIGNALS

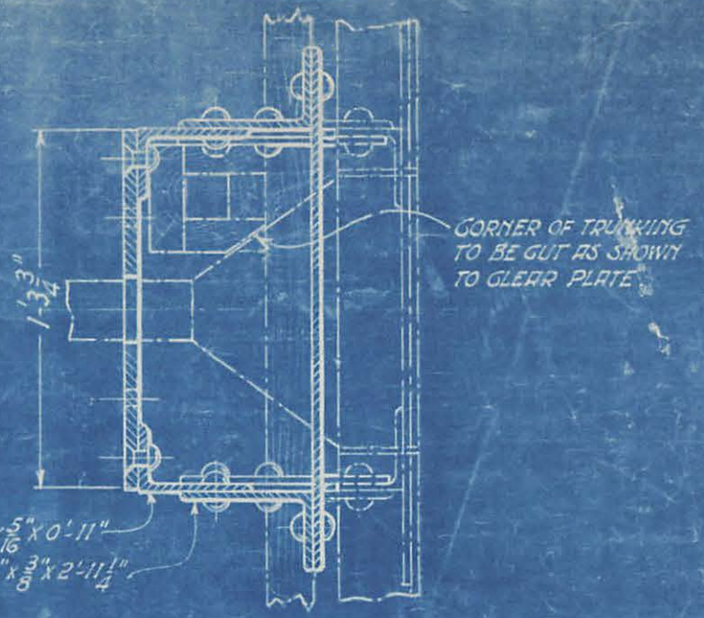
SCALE: 3/16" = 1'-0" ALBANY, MAY 29 1918

T-129
REV. 2

5-28-18



SECTION THROUGH ℄ A-A.



SECTION THROUGH ℄ B-B.

NOTE: WHERE BOTTOM ARM OF INTERLOCKING BRIDGE SIGNAL IS POWER OPERATED SIGNAL SHALL BE SUPPORTED AS PER PLAN T-128.
FOR ARRANGEMENT OF SIGNAL SUPPORTS ON SIGNAL BRIDGES SEE PLAN T-13.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

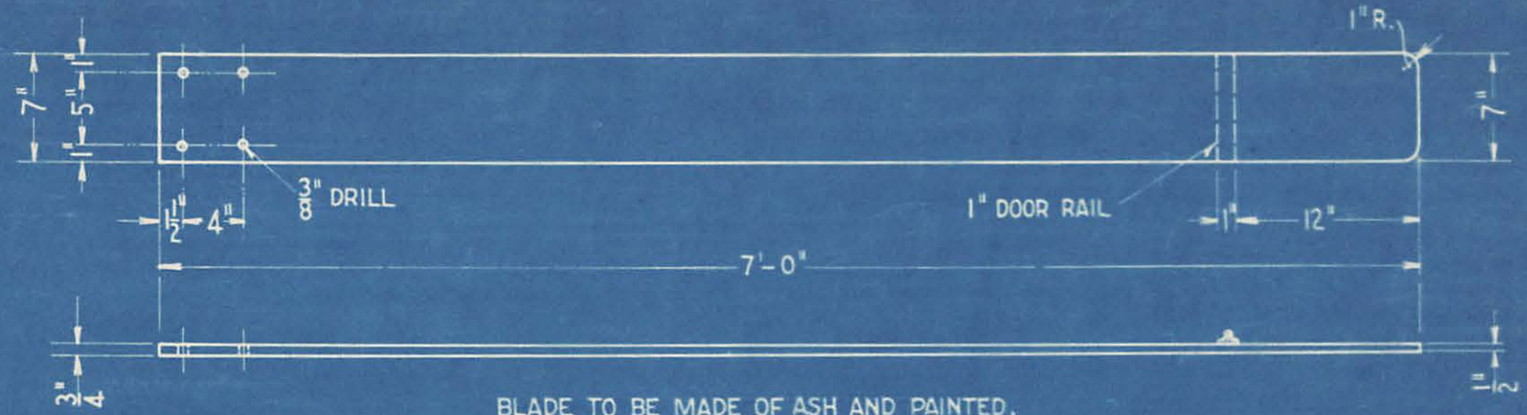
BRIDGE SIGNAL SUPPORT.

SCALE: 1½"=1' ALBANY, MARCH 5TH 1912.

W.H. Elliott 3/15/12.

T-129 01 ASSEMBLY

T-130
REV.



BLADE TO BE MADE OF ASH AND PAINTED,
FRONT RED AND BACK AND EDGES BLACK.

NOTE: FOR WASHER STRIPS AND BLADE BOLTS SEE PLAN N.Y.C. LINES 100.

NO LIGHTS TO BE USED IN CONNECTION WITH BLADES, EXCEPT BY SPECIAL INSTRUCTIONS FROM THE SUP'T.

BLADE IN EACH CASE TO BE LONG ENOUGH TO EXTEND OVER NEAREST RAIL WHEN IN A HORIZONTAL POSITION AND AT A HEIGHT OF NOT MORE THAN 8 FT. ABOVE TOP OF RAIL.

N. Y. C. R. R.

SIGNAL DEPARTMENT

SMASH SIGNAL BLADE

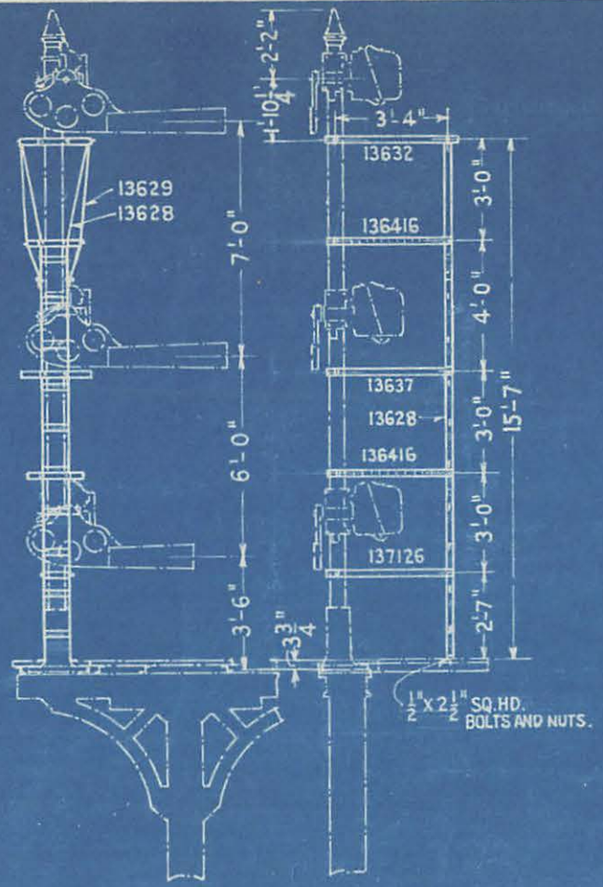
SCALE: 1"= 1'-0" ALBANY, DEC. 22-1911.

W. H. Elliott 12/29/11.

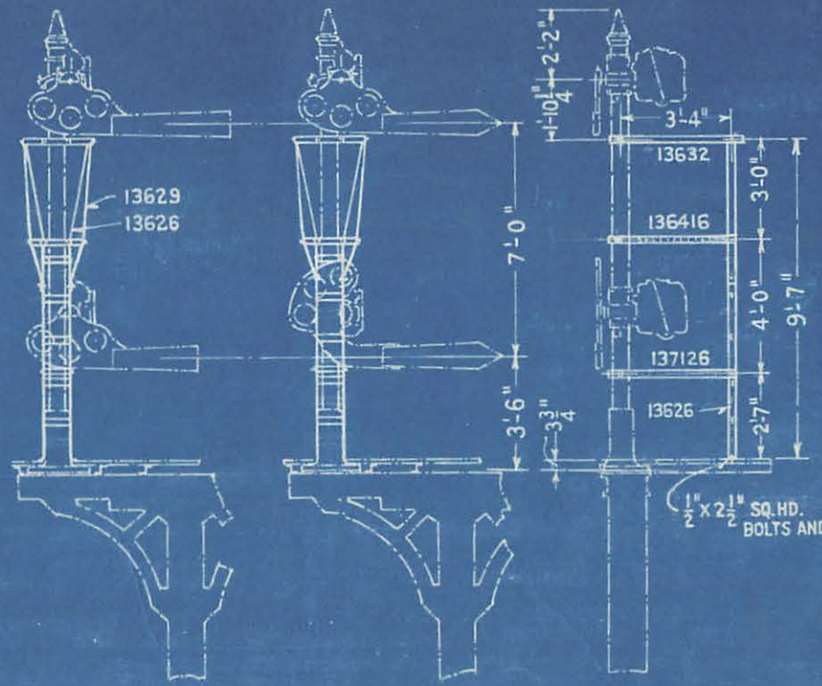
SIGNAL ENGINEER.

T-131
REV. 5

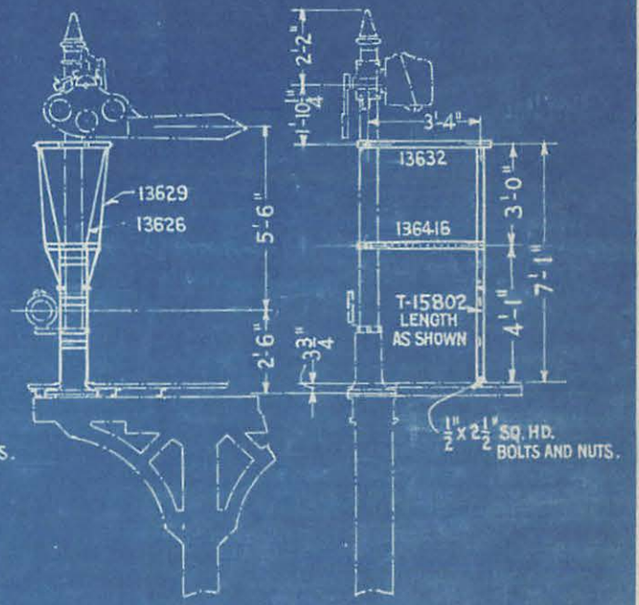
5-29-18



3 ARM HOME
T-57010, PIPE.
RSA 13662 LADDER COMPL.



2 ARM HOME AND AUTO.
T-5709, PIPE.
RSA 13661, LADDER COMPL.



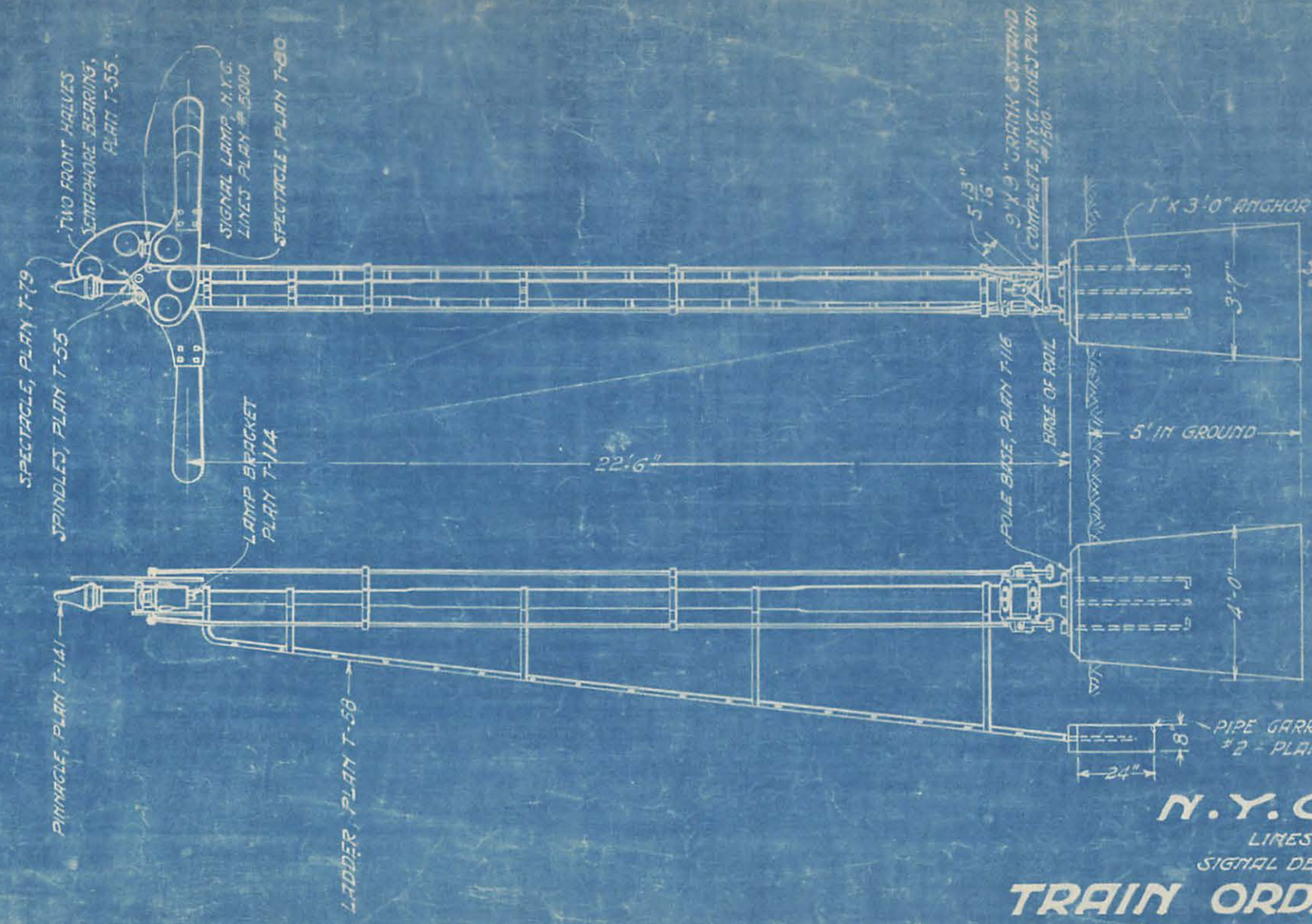
1 ARM AUTO.
T-5707, PIPE
T-13101, LADDER COMPL. (LENGTH AS SHOWN).

NOTE: RSA REFERENCE NOS. USED FOR LADDERS. EXCEPT AS NOTED.

N.Y.C.R.R.
SIGNAL DEPARTMENT
BRACKET SIGNALS.
SCALE: 3/16" = 1'-0" ALBANY, MAY 29, 1918.

W. H. Elliott 5/30/18
SIGNAL ENGINEER

T-134
Rev.



N.Y.C.R.R.

LINES EAST

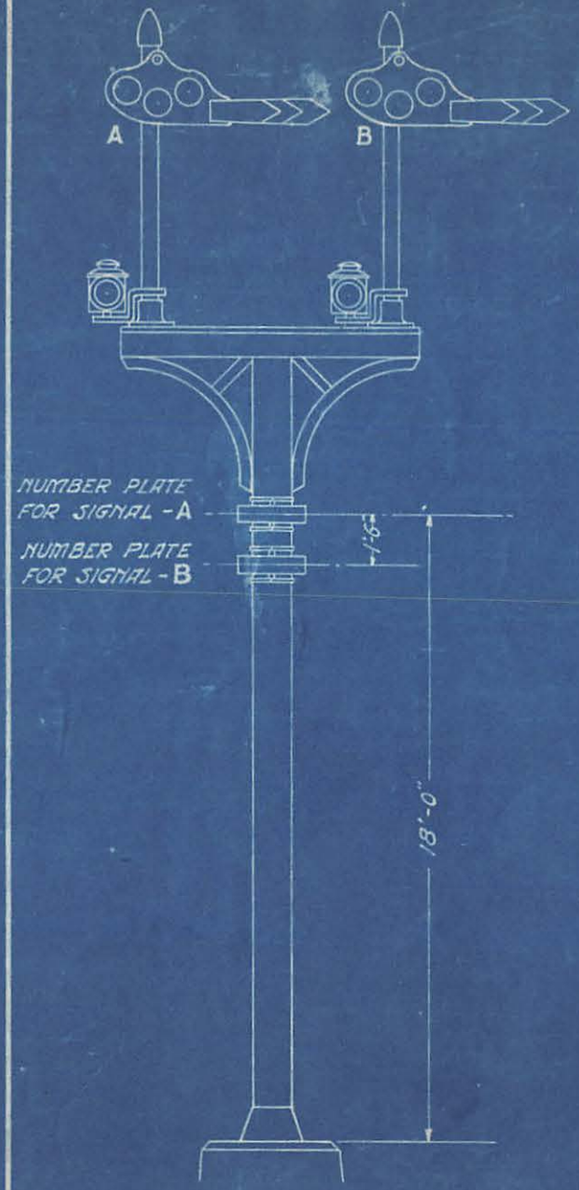
SIGNAL DEPARTMENT

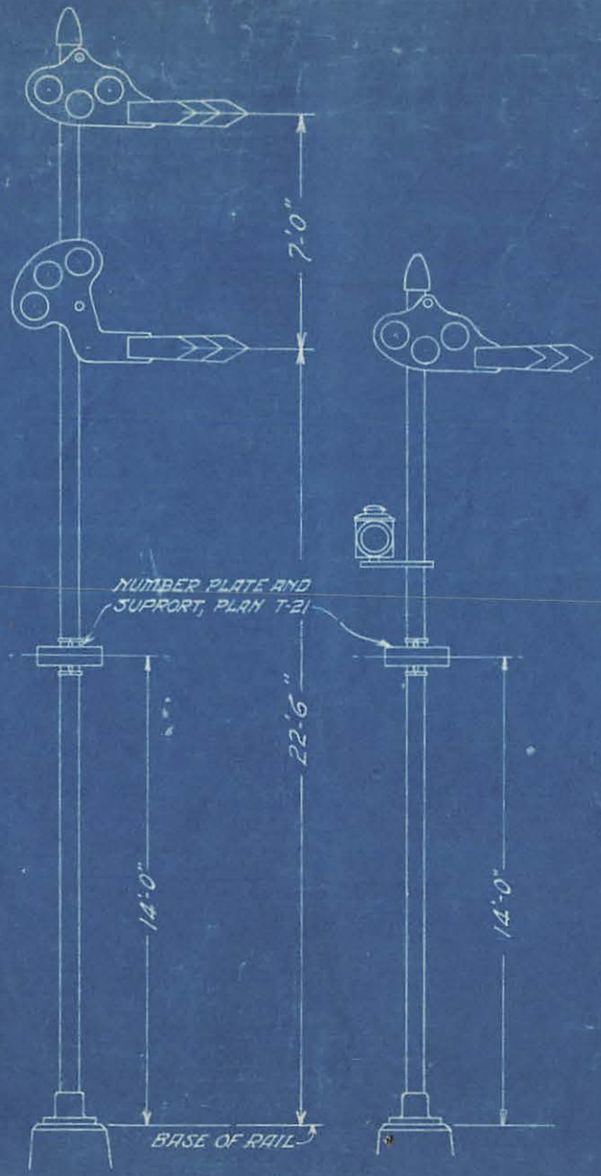
TRAIN ORDER SIGNAL, ONE LIGHT UPPER QUADRANT.

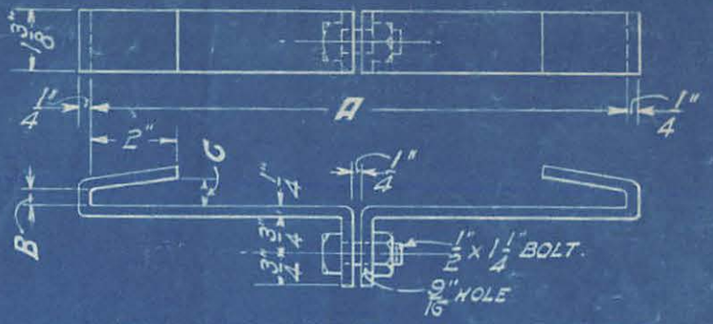
SCALE 1"=1'-0" ALBANY JULY 28, 1913.

W.H. Elliott 7-29-13.

SIGNAL ENGINEER.







NUMBER PLATE SUPPORT FOR BRACKET POSTS
W.I. - 2 WANTED

BRACKET POSTS	A	B	C	REF. NOS.
T-96 - T-97	16"	11/16"	7/8"	T-13801
RSA 1032	12 1/2"	9/16"	3/4"	T-13802
T-19, T-29, T-90	12"	3/8"	5/8"	T-13803

N.Y.C.R.R.

SIGNAL DEPARTMENT

NUMBER PLATE LOCATIONS FOR GROUND SIGNALS

SCALES 3/16"=1'-0" & 3"=1'-0" ALBANY, JUNE 29, 1912.

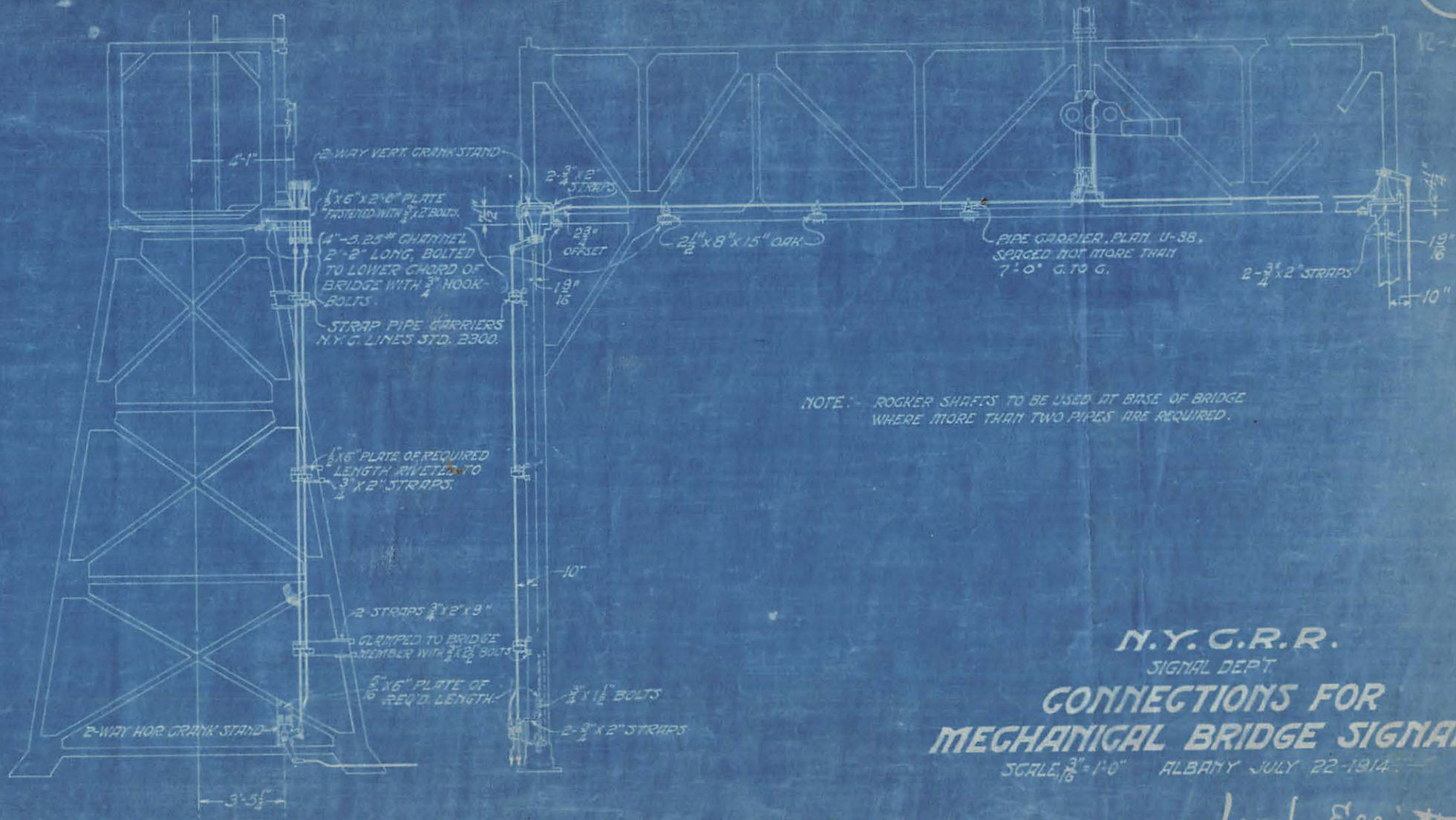
W.H. Elliott 7/3/12.

SIGNAL ENG'R.

REC'D
MAY
1917

T-142
REV 1

12-4-1


2-WAY VERT. CRANK STAND
5'-1"
⅛"X6"X2'-0" PLATE FASTENED WITH ¾"X2" BOLTS.
4"-5.25# CHANNEL 2'-2" LONG, BOLTED TO LOWER CHORD OF BRIDGE WITH ¾" HOOK-BOLTS.
STRAP PIPE CARRIERS N.Y.C. LINES STD. 2300.
⅛"X6" PLATE OF REQUIRED LENGTH RIVETED TO ¾"X2" STRAPS.
2-STRAPS ¾"X2"X9" CLAMPED TO BRIDGE MEMBER WITH ¾"X1½" BOLTS
⅜"X6" PLATE OF REQ'D. LENGTH.
2-WAY HOR. CRANK STAND
3'-5½"
2-¾"X2" STRAPS
2¾" OFFSET
1 9/16"
2½"X8"X15" OAK
10"
¾"X1½" BOLTS
2-¾"X2" STRAPS
PIPE CARRIER, PLAN U-38, SPACED NOT MORE THAN 7'-0" C. TO C.
2-¾"X2" STRAPS
1 9/16"
10"

NOTE:- ROCKER SHAFTS TO BE USED AT BASE OF BRIDGE WHERE MORE THAN TWO PIPES ARE REQUIRED.

N.Y.C.R.R.

SIGNAL DEP'T.

CONNECTIONS FOR MECHANICAL BRIDGE SIGNALS

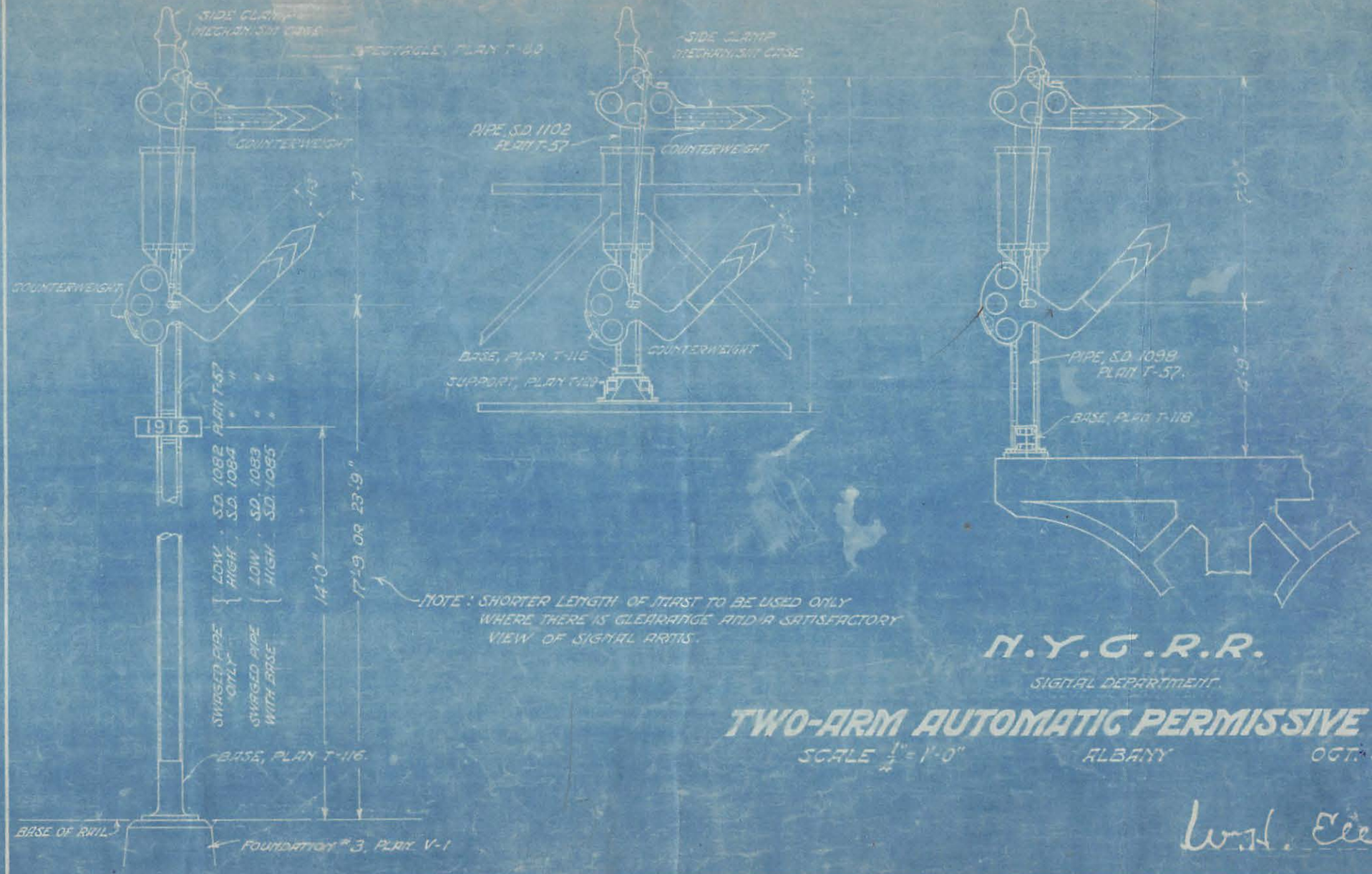
SCALE 3/16"=1'-0" ALBANY JULY 22-1914.

W. J. Elliott 7/23
SIGNAL ENGR.

REC'D
DEC
13
1916
THE U. S. & S. CO.
PITTSBURGH, PA.

RECEIVED
DEC 12 1916
Union Switch & Signal Co.
50 CHURCH ST., N.Y.

T-143
REV.



NOTE: SHORTER LENGTH OF MAST TO BE USED ONLY WHERE THERE IS CLEARANCE AND A SATISFACTORY VIEW OF SIGNAL ARMS.

N.Y.C.R.R.

SIGNAL DEPARTMENT

TWO-ARM AUTOMATIC PERMISSIVE SIGNAL

SCALE $\frac{1}{4}$" = 1'-0" ALBANY OCT. 31, 1913.

Wm. H. Elliott. 10/31/13.

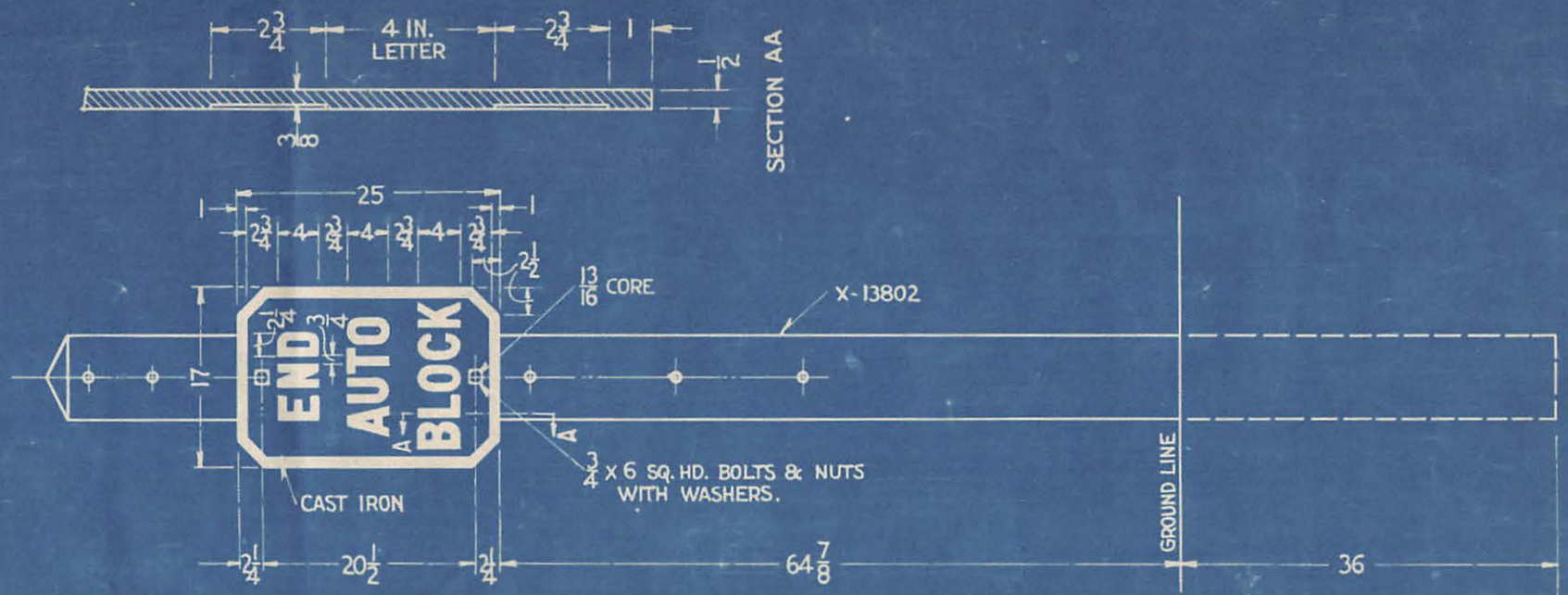
SIGNAL ENG'R.

RECD
JUL
27
1916
THE U. S. S. & G. CO.
SWISSVALE, PA.

RECEIVED
JUL 26 1916
Union Switch & Signal Co.
80 Pinehon St., N.Y.

RECEIVED
JUL
27
1916

T-147
REV. 2
5-31-23



T-14701 SIGN ONLY, WITH BOLTS.

0 3 6 9 12 24 36
0 1 2 3 6 9
SCALES AND ALL DIMENSIONS ARE GIVEN IN INCHES.

NOTE: SIGN SHALL HAVE 1 IN. BLACK MARGIN, YELLOW FIELD AND BLACK LETTERS.

PRIMING COAT: FORMULA "E".
2 ND. AND 3 RD. COATS: CHROME YELLOW, FORMULA "M".
BLACK, FORMULA "E".

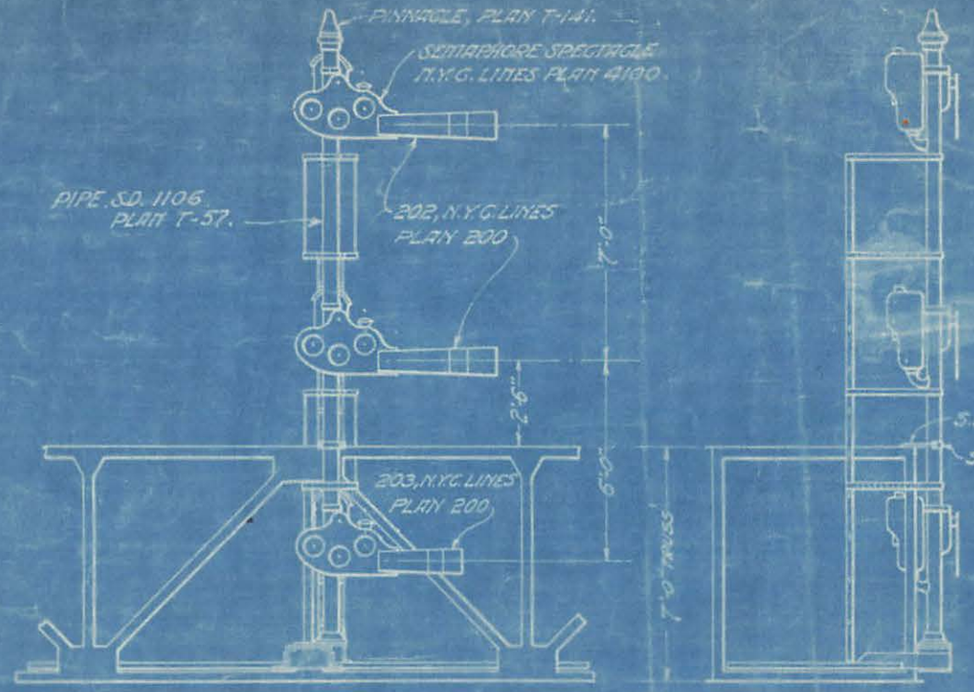
BACK OF SIGN SHALL BE PAINTED BLACK.
SIGN SHALL BE PLACED AT RIGHT ANGLES TO TRACK AND CENTER LINE OF POST SHALL BE AT LEAST 8 FT. 6 INS. FROM CENTER LINE OF TRACK.

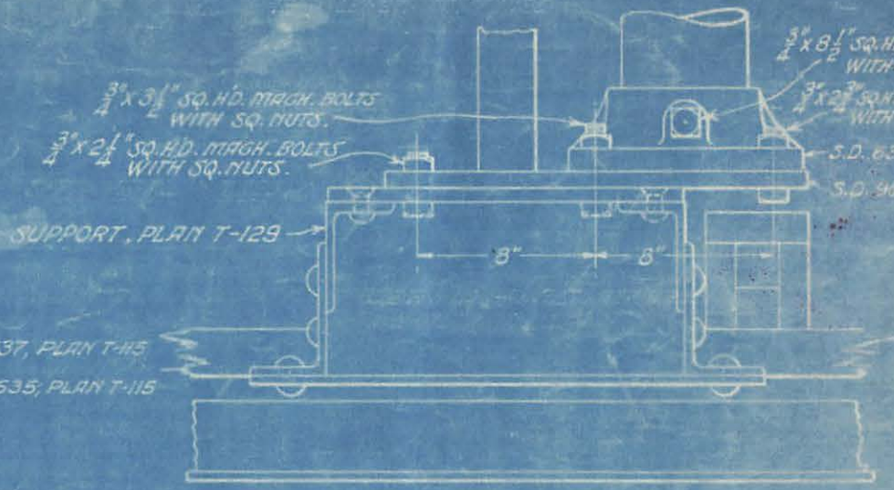
N. Y. C. R. R.
SIGNAL DEPARTMENT
END AUTOMATIC BLOCK SIGN
ALBANY, MARCH 11-1914

W. H. Elliott 4/8/23.
SIGNAL ENGINEER.

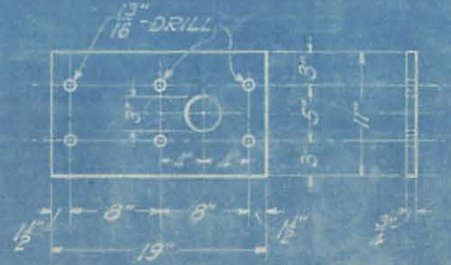
T-148
REV. 2

7-14-16




3/4" x 8 1/2" SQ. HD. MACH. BOLT WITH SQ. NUT.
3/4" x 2 3/4" SQ. H.D. MACH. BOLTS WITH SQ. NUT.
3/4" x 3 1/2" SQ. H.D. MACH. BOLTS WITH SQ. NUTS.
3/4" x 2 1/2" SQ. H.D. MACH. BOLTS WITH SQ. NUTS.
S.D. 639, PLAN T-118
S.D. 909, PLAN T-148
SUPPORT, PLAN T-129
8"
8"
S.D. 637, PLAN T-115
S.D. 635, PLAN T-115

DETAIL OF ASSEMBLY



S.D. 909-PLATE.
SHEET STEEL 1-REQ'D.

N.Y.C.R.R.

SIGNAL DEPARTMENT

INTERLOCKING BRIDGE SIGNALS

LOWER ARM POWER-OPERATED

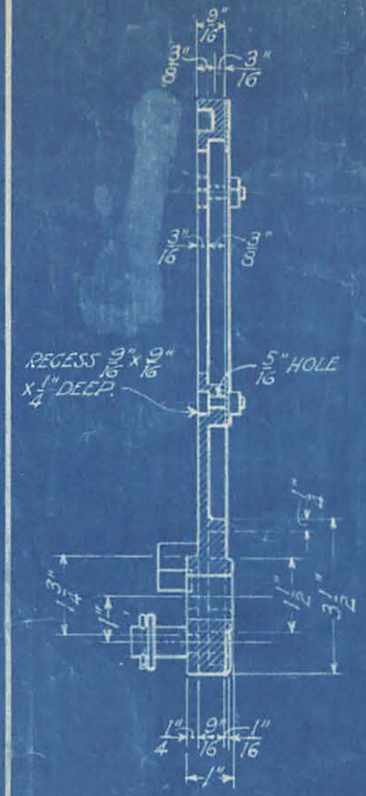
SCALES, 3/16" - 3/4" & 1 1/2" = 1'-0" ALBANY, MAR. 13, 1914.

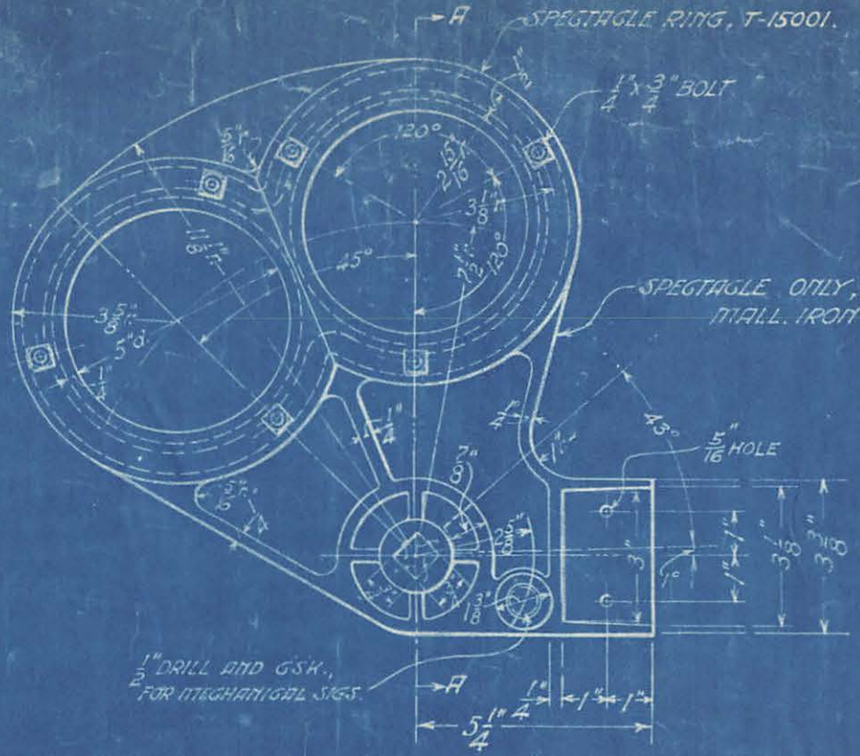
W. H. Elsey
SIGNAL ENGR.

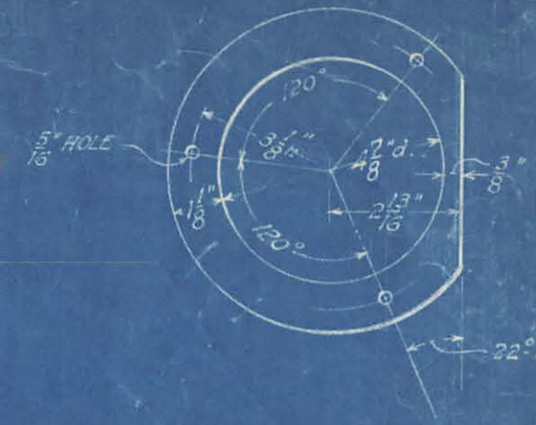
RECEIVED
JUL 27 1916
EST. DEPT.

T-150
Rev. 4

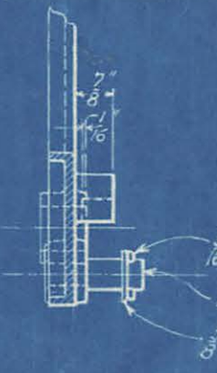
1-24-1



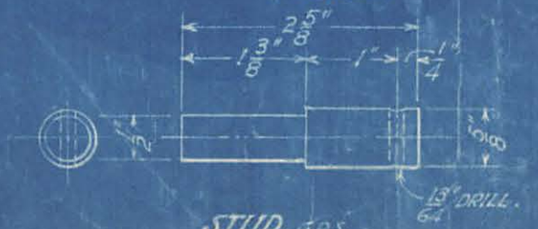




SPECTACLE RING, T-15001.
#16 U.S. STD. GAUGE SHEET IRON (.0625").



T-15003 – SPECTACLE COMPLETE, WITH STUD, WASHER AND COTTER, (FOR MECHANICAL SIG.).
T-15004 – " " " WITHOUT STUD, WASHER AND COTTER, (FOR POWER SIG.).



STUD. C.R.S.
T-15005.
SCALE: HALF SIZE.

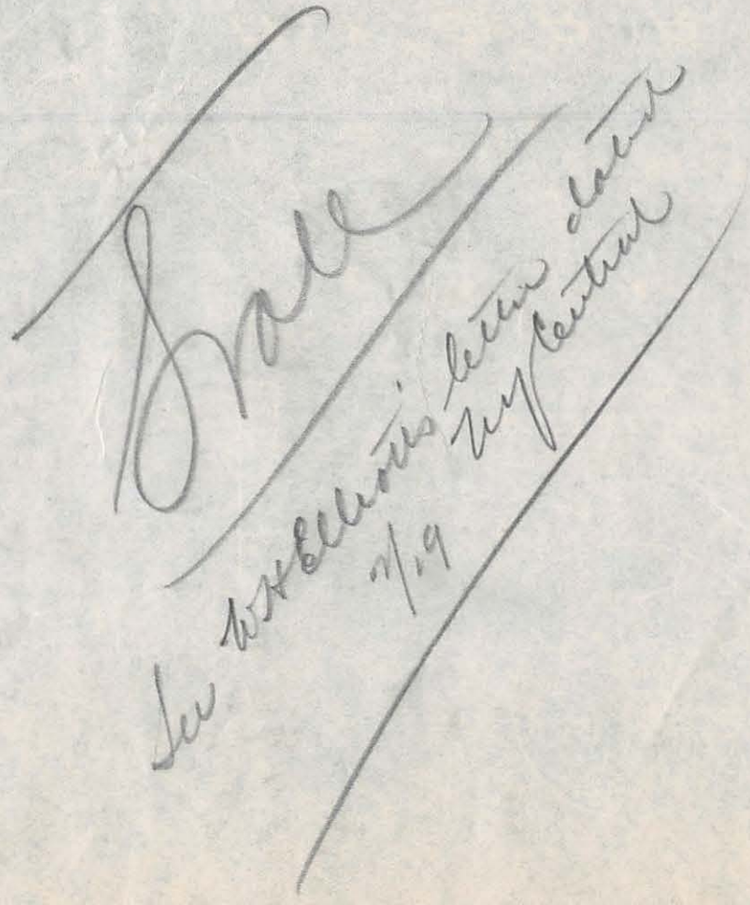
N. Y. C. R. R.

SIGNAL DEPARTMENT.

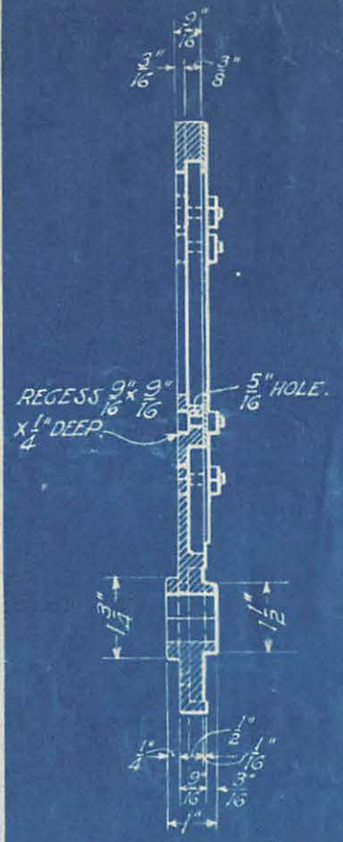
UPPER QUADRANT DWARF SPECTACLE, TWO POSITION.

SCALE: 3" = 1'-0" ALBANY, JUNE 22-1914.

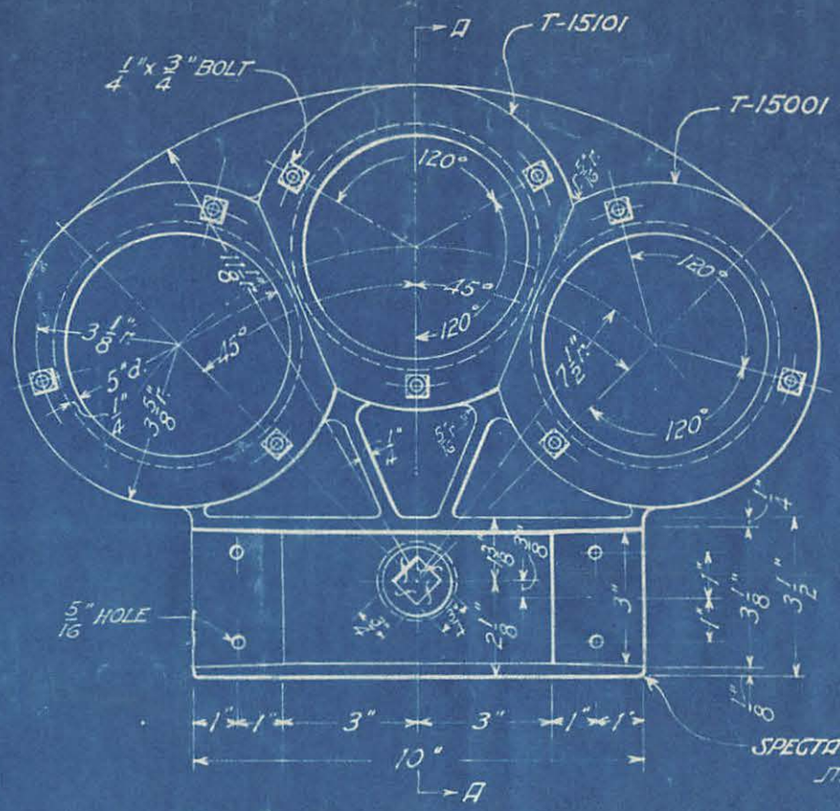
W. H. Elliott. 7/6/14
SIGNAL ENGINEER.



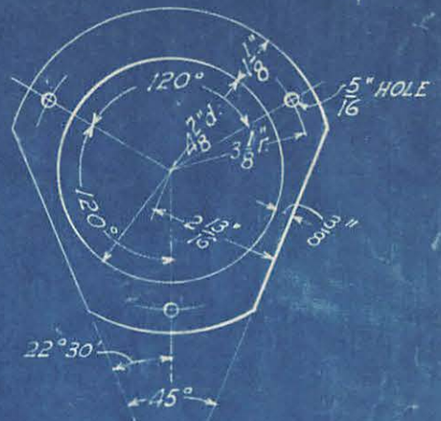
T-151
REV. 1
1-24-18



SECTION A-A.



SPECTACLE COMPLETE, T-15103



SPECTACLE RING, T-15101
#16 U.S. STD. GAUGE SHEET IRON (.0625").

SPECTACLE ONLY, T-15102
SMALL IRON.

N.Y.C.R.R.

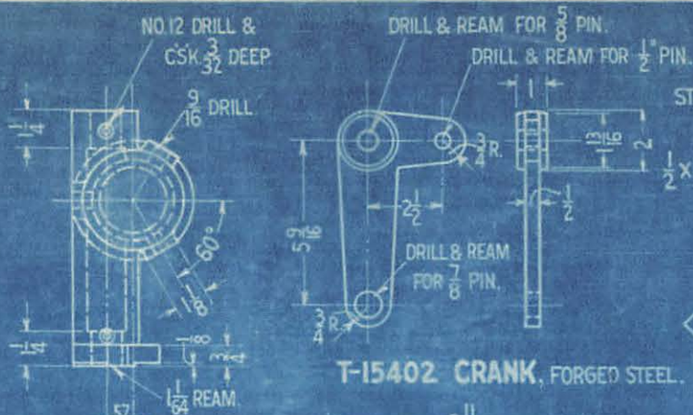
SIGNAL DEPARTMENT.

UPPER QUADRANT DWARF SPECTACLE, THREE POSITION.

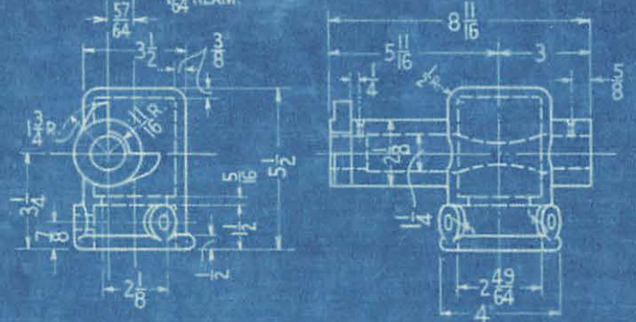
SCALE: 3" = 1'-0". ALBANY, JUNE 22 - 1914.

W. H. Elliott 7/14

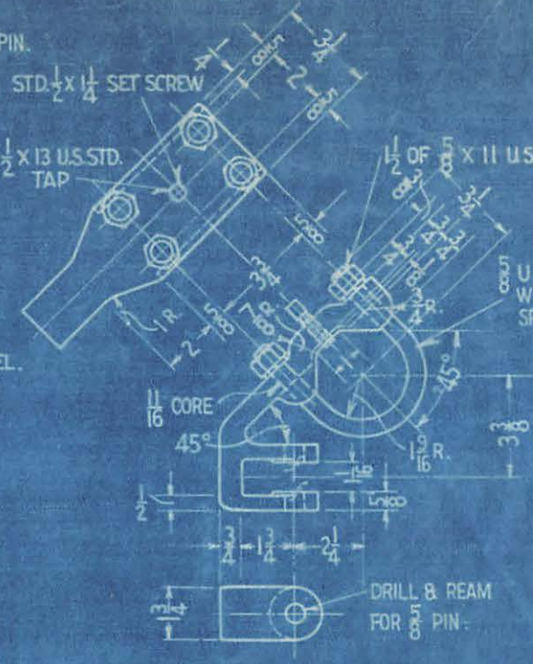
SIGNAL ENGINEER.



T-15402. CRANK, FORGED STEEL.



T-15401. SHAFT BEARING, C.I.


STD. 1/2 X 1 1/4 SET SCREW
1/2 X 13 U.S.STD. TAP
1 1/2 OF 5/8 X 11 U.S.ST. THD.
5/8 U-BOLT (O.H.STEEL) WITH HEX. NUTS & SPRING WASHERS.
11/16 CORE
45°
DRILL & REAM FOR 5/8 PIN.

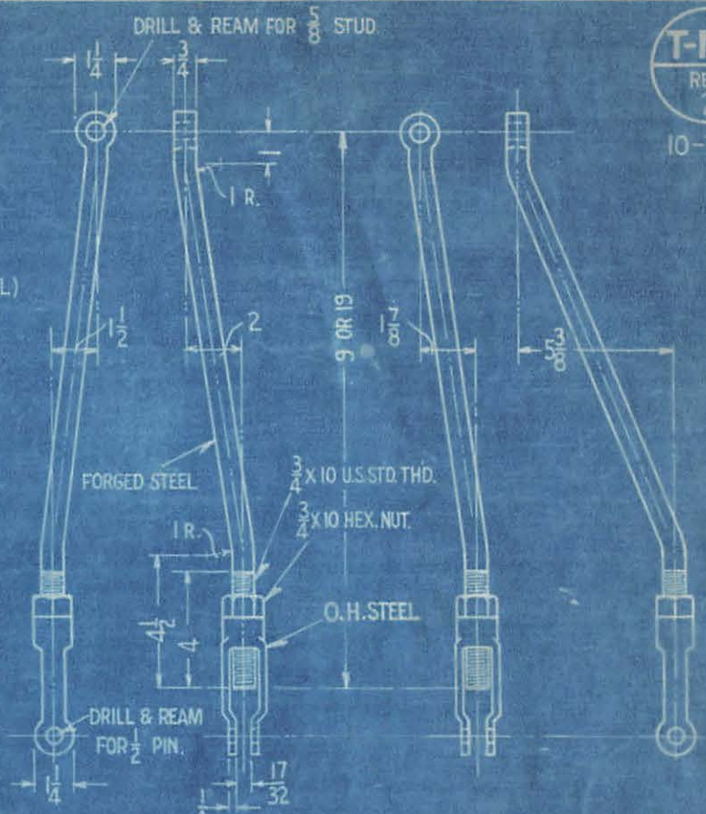
T-15403. CRANK STAND, C.I.

T-15408. PIN, C.R.S.

T-15409. PIN, C.R.S.

T-15410. SHAFT, C.R.S.

SCALES AND ALL DIMENSIONS GIVEN IN INCHES



ROD FOR CROSS LEAD
T-15404, 9 IN. ROD.
T-15406, 19 " "

ROD FOR PARALLEL LEAD
T-15405, 9 IN. ROD.
T-15407, 19 " "

T-154
REV. 2
10-7-

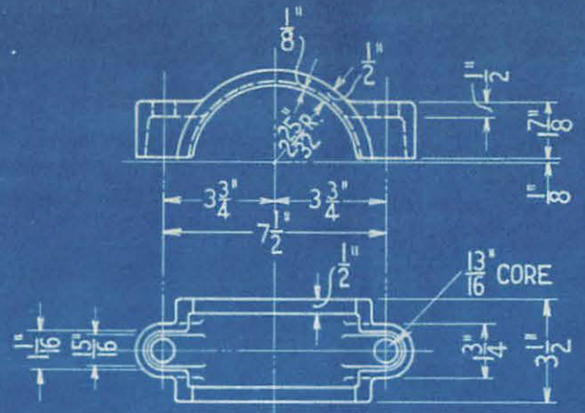
N. Y. C. R. R.
SIGNAL DEPARTMENT.

UPPER QUADRANT DWARF SIGNAL DETAILS

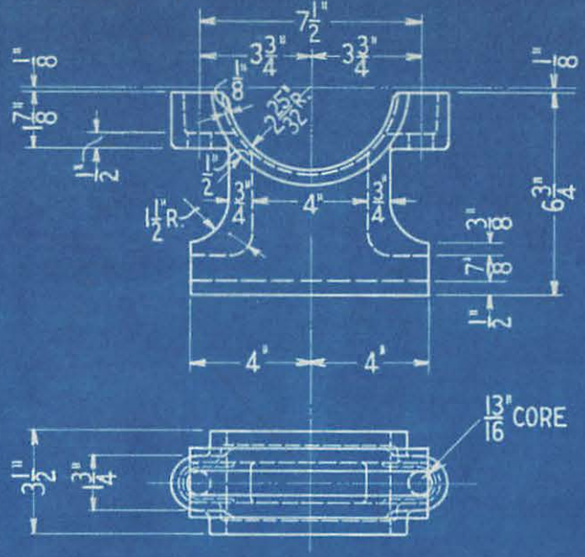
ALBANY, AUG. 17 - 1916.

W. H. Elliott 10/7/12.
SIGNAL ENGINEER.

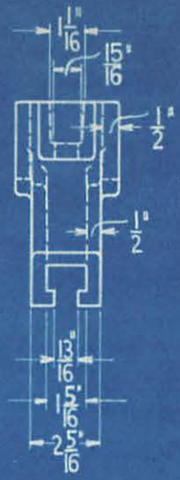
T-156
REV.
1

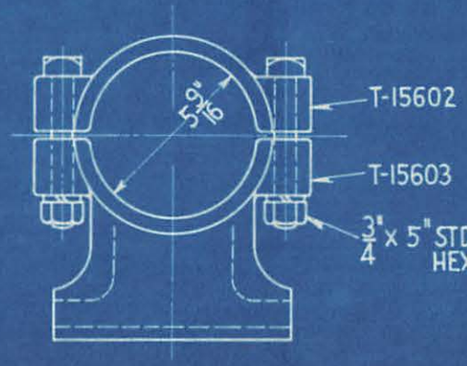


T-15602 BACK HALF
CAST IRON



T-15603 FRONT HALF
CAST IRON.





T-15601 ASSEMBLY FOR 5" PIPE.

N. Y. C. R. R.

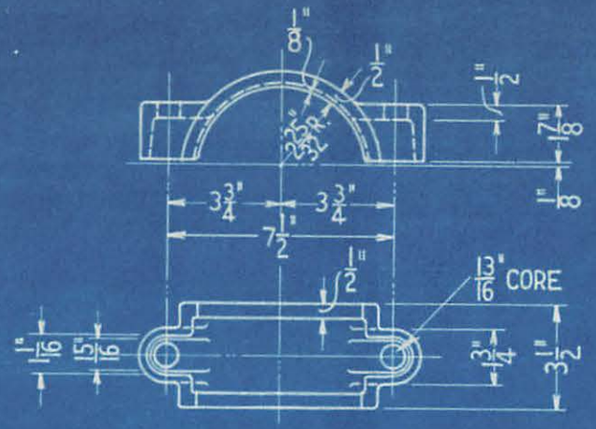
SIGNAL DEPARTMENT

CLAMP FOR BRIDGE MASTS

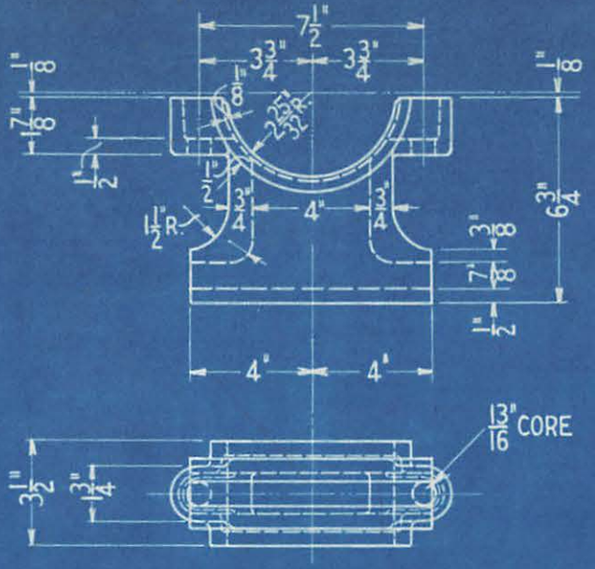
SCALE: 2" = 1'-0" ALBANY, APRIL 19 - 1917.

W. H. Elliott 9/21/21.
SIGNAL ENGINEER.

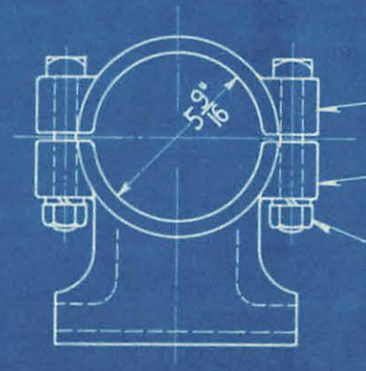
T-156
REV. 1



T-15602 BACK HALF
CAST IRON



T-15603 FRONT HALF
CAST IRON.



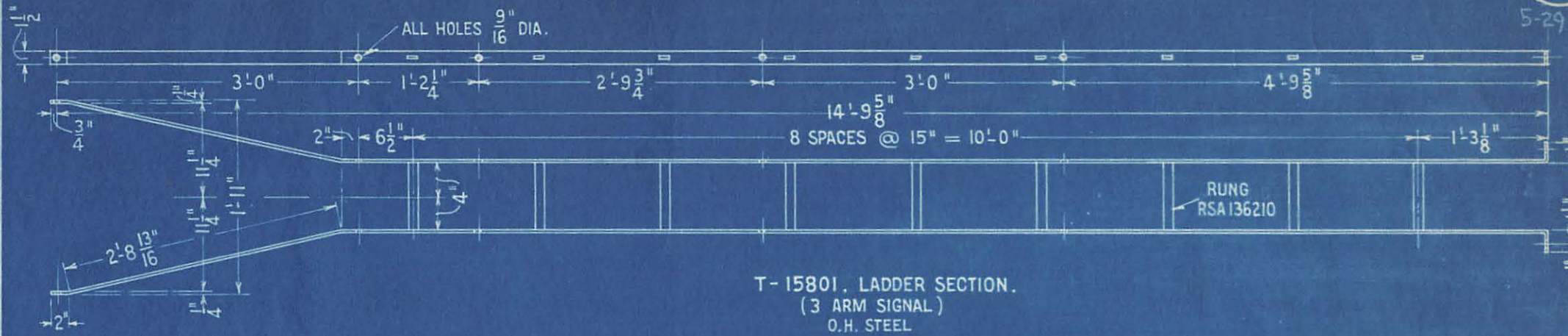
T-15601 ASSEMBLY FOR 5" PIPE.

N. Y. C. R. R.
SIGNAL DEPARTMENT
CLAMP FOR BRIDGE MASTS
SCALE: 2" = 1'-0". ALBANY, APRIL 19 - 1917.

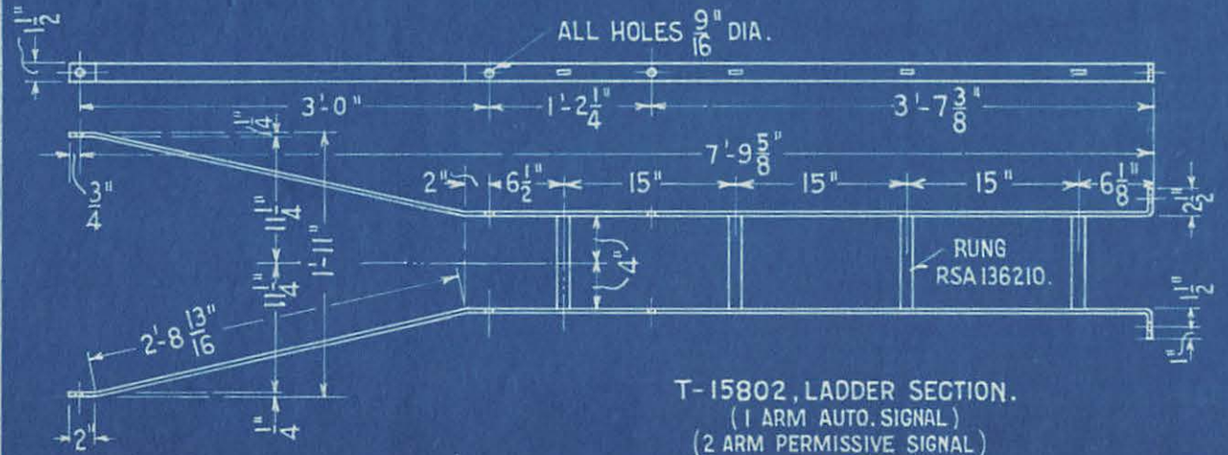
W. H. Elliott 9/21/21
SIGNAL ENGINEER.

T-158

5-29-1



T-15801, LADDER SECTION.
(3 ARM SIGNAL)
O.H. STEEL



T-15802, LADDER SECTION.
(1 ARM AUTO. SIGNAL)
(2 ARM PERMISSIVE SIGNAL)
O.H. STEEL

NOTE: LADDERS ARE IDENTICAL WITH RSA 1362 EXCEPT AS TO LENGTH.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

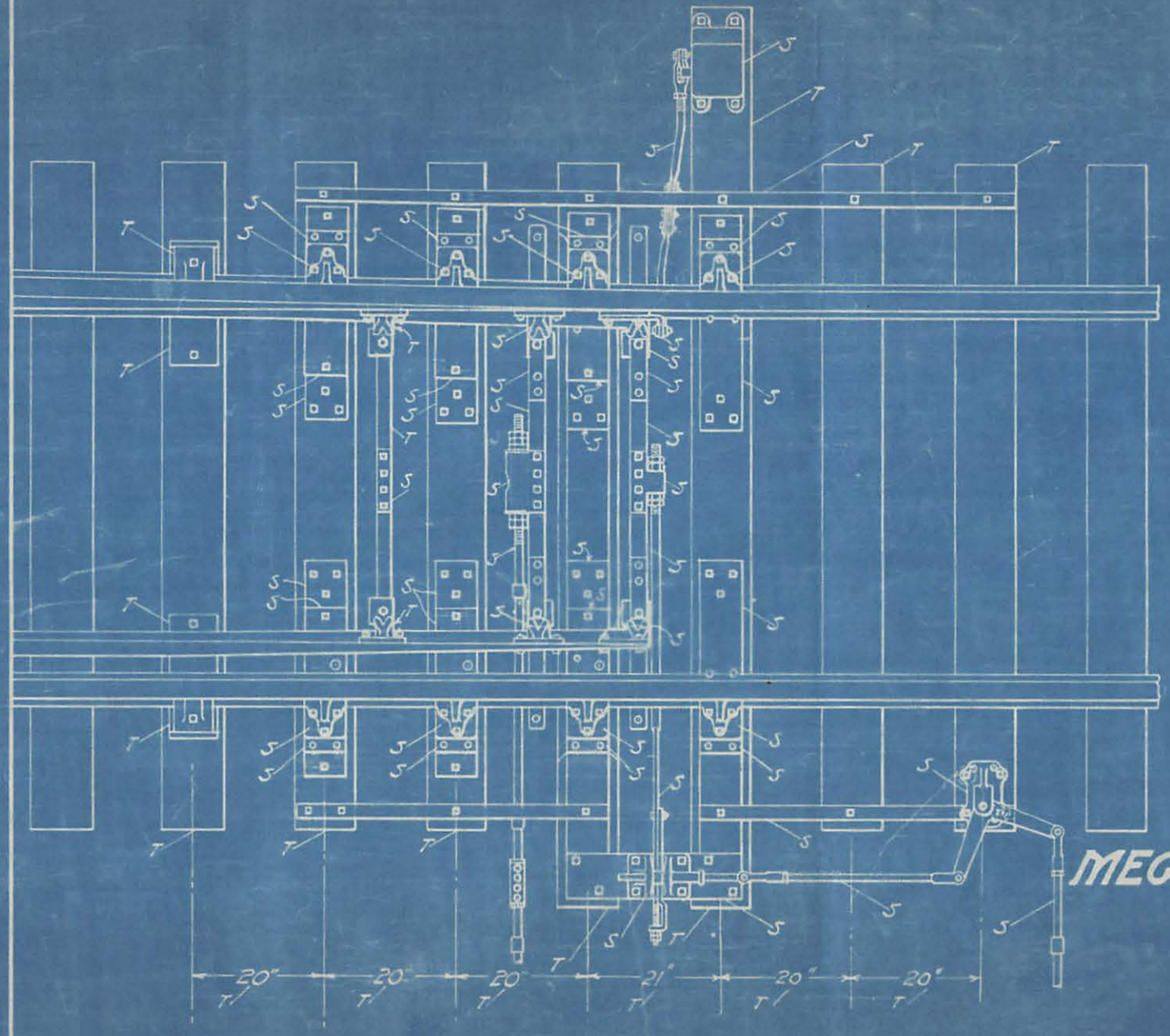
LADDERS - BRIDGE SIGNALS.

SCALE 3/4" = 1'-0". ALBANY, MAY 29th 1918.

W.H. Elliott 5/20/18.

SIGNAL ENGINEER.

U-10
REV. 5
8-14-15



NOTE: PARTS MARKED "S" TO BE MAINTAINED BY SIGNAL DEPARTMENT.
PARTS MARKED "T" TO BE MAINTAINED BY TRACK DEPARTMENT.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

MECHANICAL SWITCH CONNECTIONS.

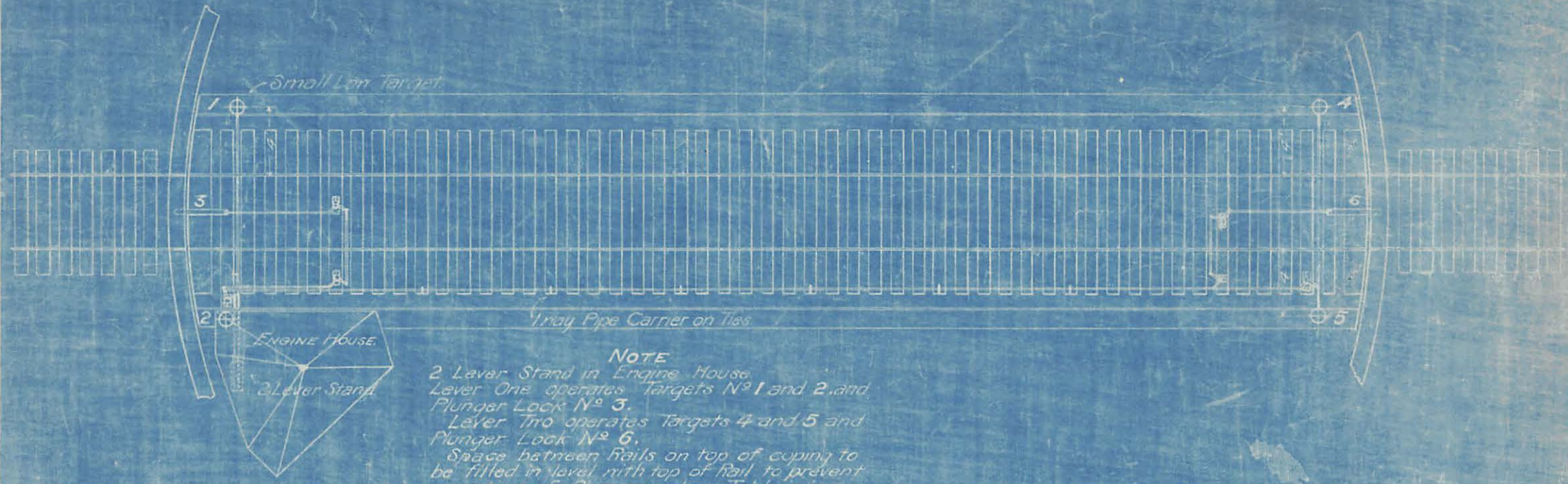
ASSIGNMENT OF MAINTENANCE WORK.

ALBANY MAR. [illegible] 1912.

W. H. Elliott 4/6/12.
SIGNAL ENG'R.

RECD
SEP
1915
THE
S. S. S. CO.
ATLA. GA.

U-20
Issue No 2

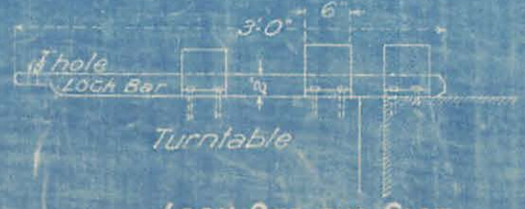


NOTE

2 Lever Stand in Engine House.
Lever One operates Targets No 1 and 2 and Plunger Lock No 3.
Lever Two operates Targets 4 and 5 and Plunger Lock No 6.
Space between Rails on top of coping to be filled in level with top of Rail to prevent operation of Plunger unless Table is in proper position to be used.
Target No 2 to be placed on roof of Engine House

N.Y.C.&H.R.R.R.

STANDARD TURNTABLE LOCK



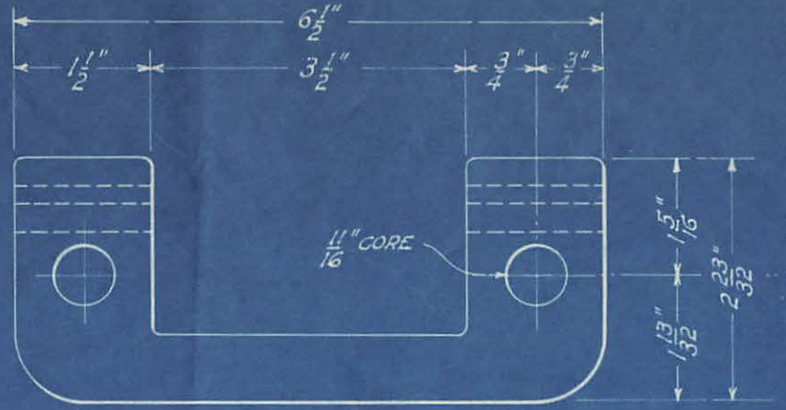
LOCK BAR AND SLOT

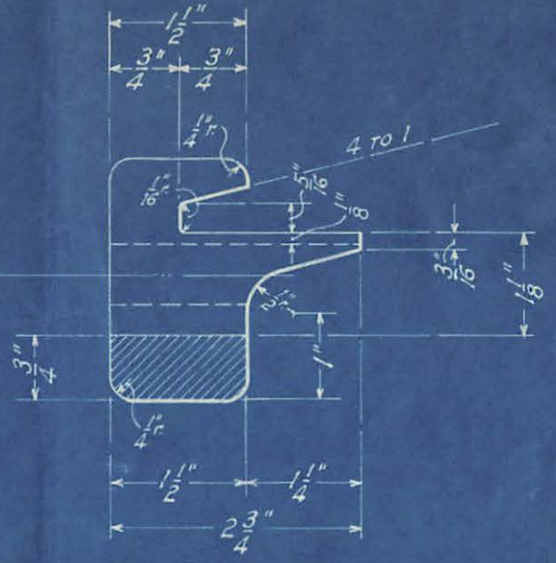
W. H. Elliott.
Engineer M. of W.

Engineer of Signals

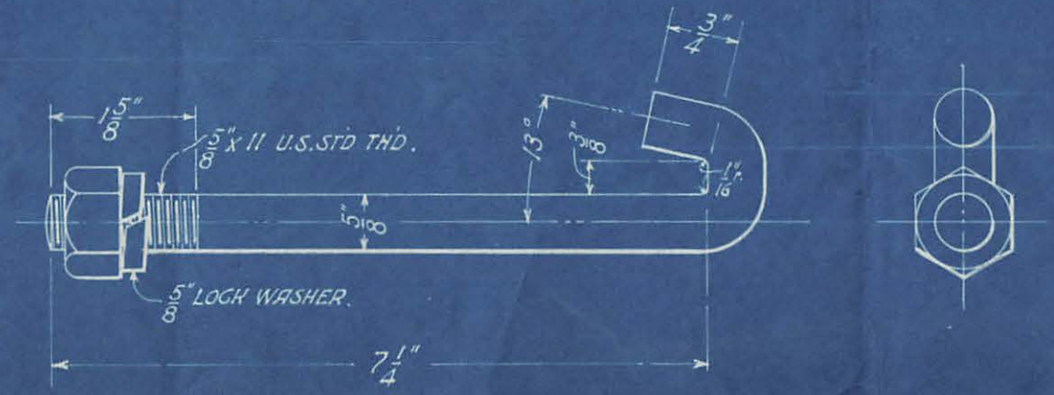
Gen'l Sup't

U-21
REV. 3





GUIDE MALL. IRON,
S.D. 1046.



HOOK BOLT 702,
N.Y.C. LINES PLAN 700.
2 REQUIRED.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

GUIDE,

DERAIL HEAD & THROW RODS.

SCALE: HALF SIZE :- ALBANY, NOV. 22-15.

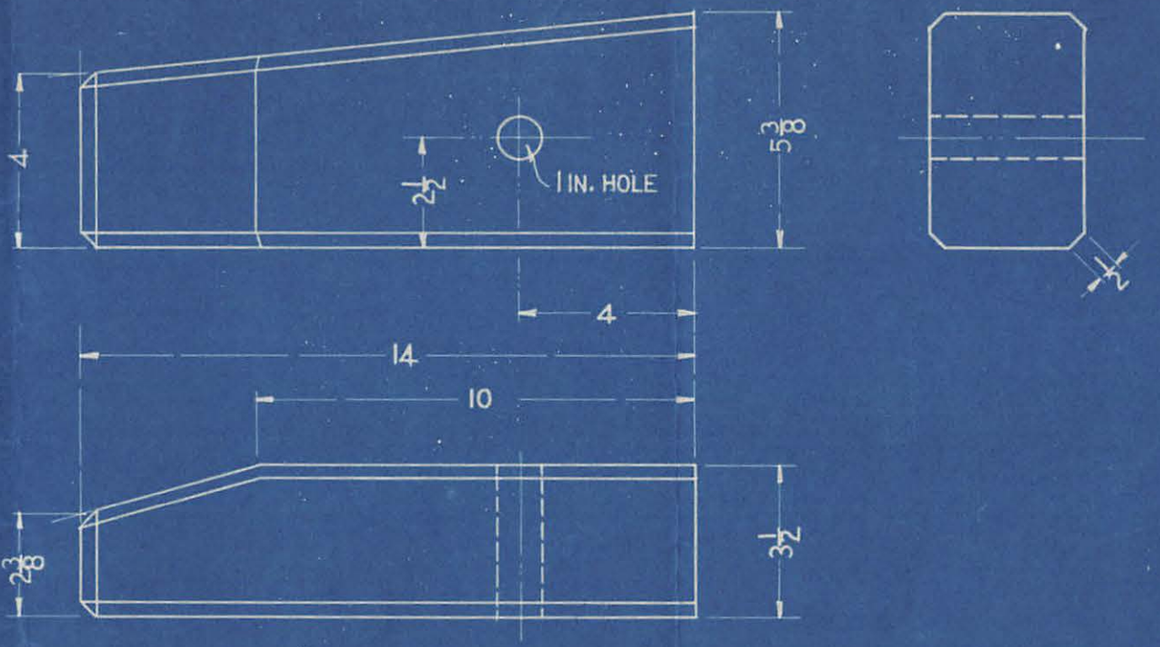
W.H. Elliott. 11/24/15.
SIGNAL ENGINEER.

DEC 29 15
Co

DEC
29
1915
U. S.

U-26

12-4-3



U-2601

MATERIAL: CLEAR, SEASONED OAK.

0 3 6 9 12

SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPT.- BUFFALO AND EAST

SWITCH BLOCK

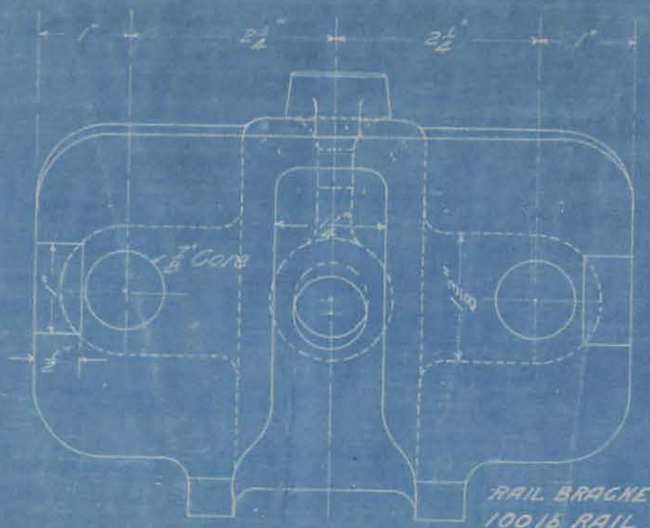
ALBANY. DEC. 4-1931.

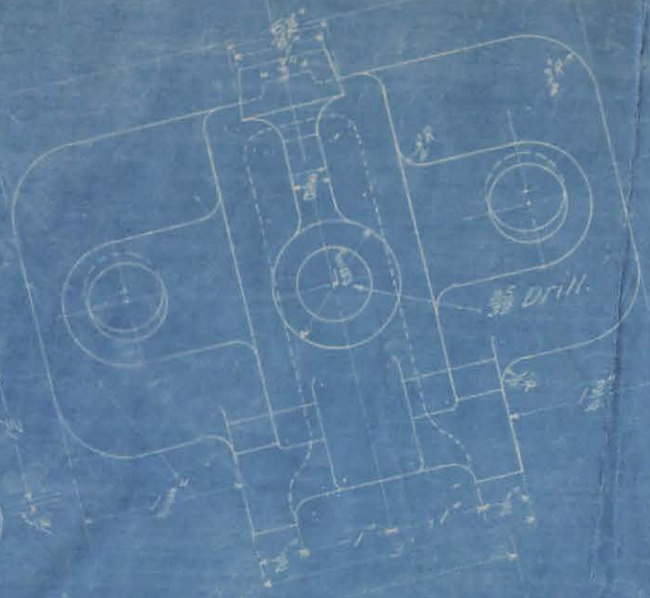
W. H. Elliott 12/21/31.

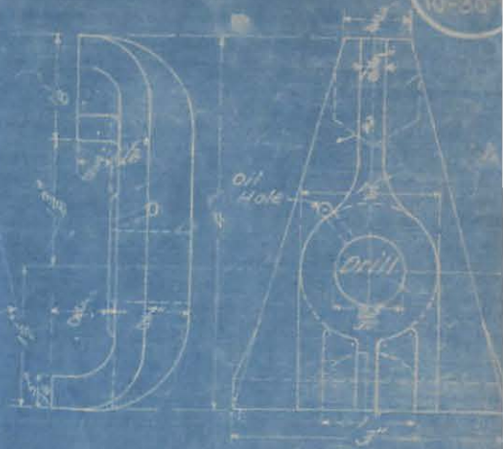
SIGNAL ENGR.

DEPT. 41
JAN
2
1932
U. S. S. & S. CO.

JAN 2 1932
A. M.
NO
ATTENTION
Ans'd
Date

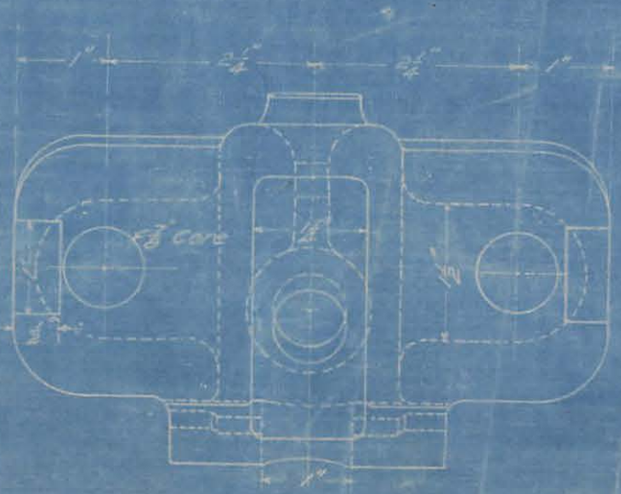


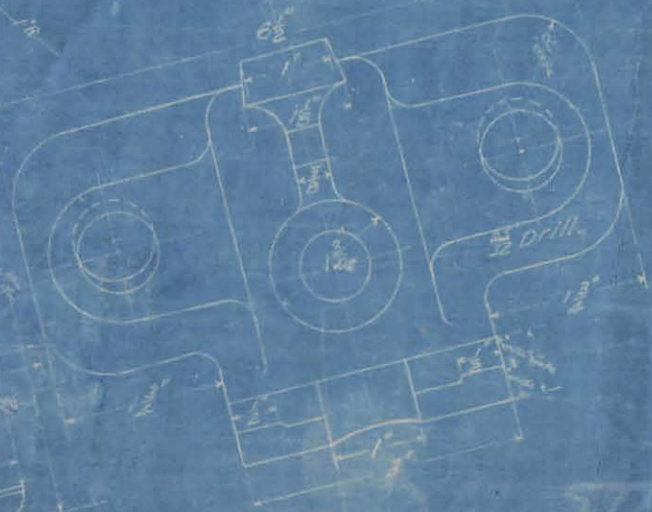




CLIP FOR MOTION PLATE
MAL. IRON S.D 47

NOTE
Clip must be fitted to rail to give full bearing under head at top of base of rail and on lugs on web of rail.





RAIL BRACKET FOR 80 lb. RAIL
MAL. IRON S.D 46.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

RAIL CLIPS

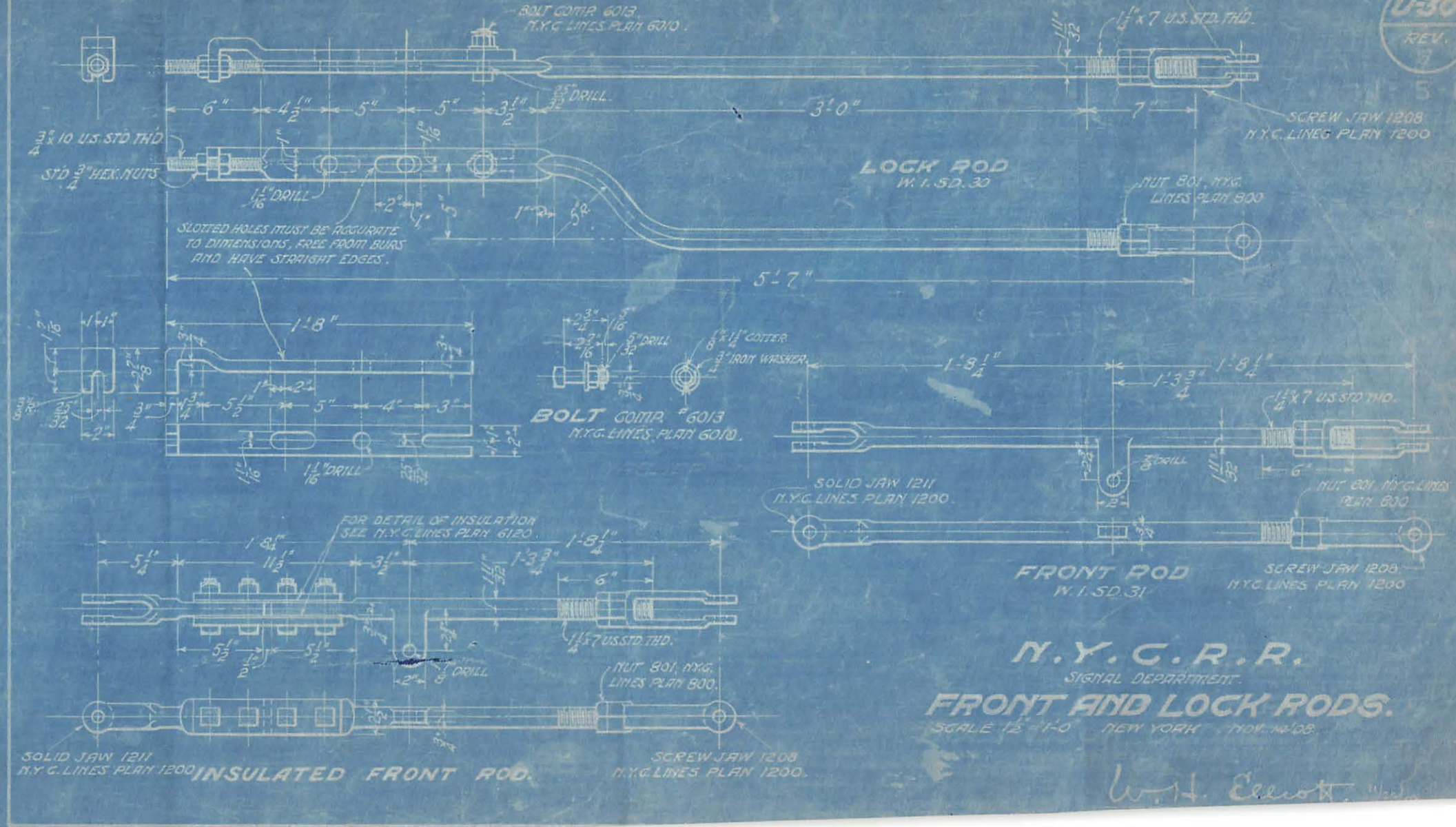
FOR 5 1/8" 80 LB RAIL & 6" 100 LB RAIL.

SCALE: HALF SIZE. BLUEPRINT OCT. 30 1916.

RECEIVED
NOV 10 1916
Union Switch & Signal Co.
80 CHURCH ST., N. Y.

REC'D
NOV 14 1916
THE U. S. & S. CO.
SWISSVALE, PA.

U-30
REV. 7


BOLT COMP. 6013.
N.Y.C. LINES PLAN 6010.
1¼" x 7 U.S. STD. THD.
SCREW JAW 1208.
N.Y.C. LINES PLAN 1200
LOCK ROD
W. I. SD. 30
NUT 801, N.Y.C.
LINES PLAN 800
3'-0"
5'-7"
SLOTTED HOLES MUST BE ACCURATE TO DIMENSIONS, FREE FROM BURS AND HAVE STRAIGHT EDGES.
3/4 x 10 U.S. STD THD
STD 3/4" HEX. NUTS
BOLT COMP. 6013
N.Y.C. LINES PLAN 6010.
1/8" x 1 1/2" COTTER
3/4" IRON WASHER
SOLID JAW 1211
N.Y.C. LINES PLAN 1200.
FRONT ROD
W. I. SD. 31
SCREW JAW 1208
N.Y.C. LINES PLAN 1200
FOR DETAIL OF INSULATION SEE N.Y.C. LINES PLAN 6120.
INSULATED FRONT ROD.
SOLID JAW 1211
N.Y.C. LINES PLAN 1200
SCREW JAW 1208
N.Y.C. LINES PLAN 1200.

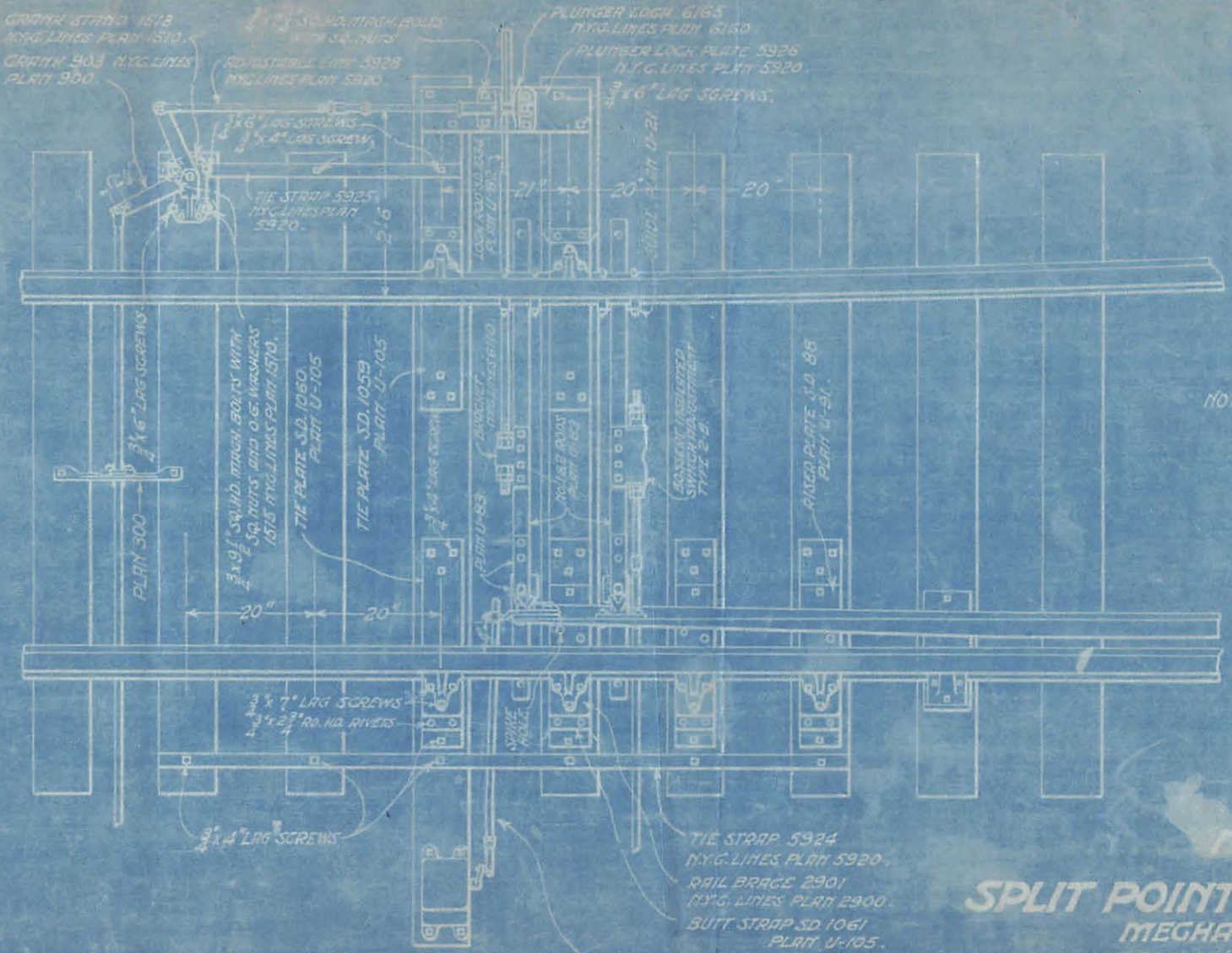
N.Y.C.R.R.

SIGNAL DEPARTMENT.

FRONT AND LOCK RODS.

SCALE 12"=1'-0" NEW YORK, NOV. 1908.

W. H. Elliott, Jr.



NOTE:
LOCK ROD TO HAVE BUT ONE HOLE FOR PLUNGER AND THAT TO LOCK POINT IN CLOSED POSITION.
HOLE IN LOCK ROD SHALL BE 1 1/16" DIA.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

SPLIT POINT DERAIL CONNECTIONS.

MECHANICAL INTERLOCKING.

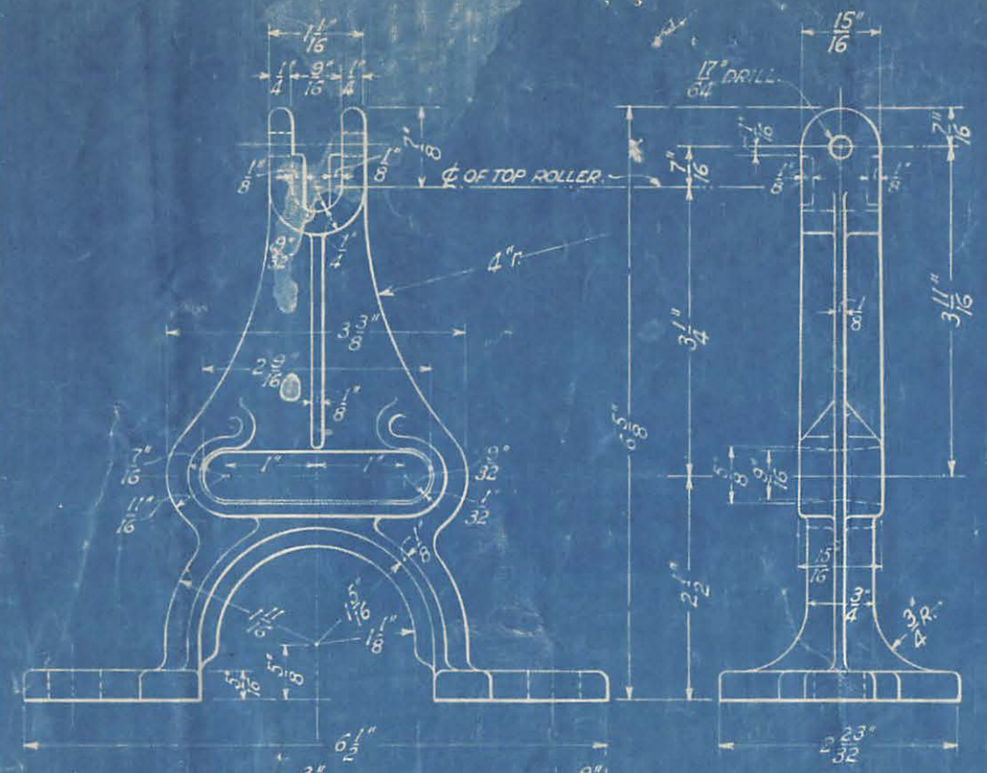
SCALE: 1/2" = 1'-0". ALBANY, FEB. 12th, 1912.

U-34

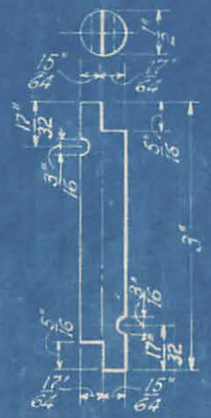
RECEIVED
SEP 9 1916
Union Switch & Signal Co.
80 CHURCH ST., N. Y.

REC'D
SEP
1916
THE U. S. & S. CO.
SWISSVALE, PA.

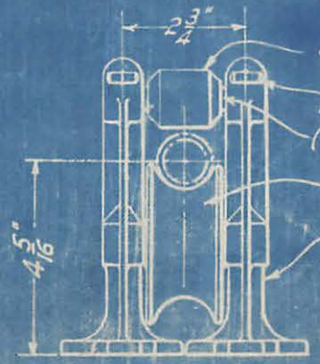
U-38
REV.



PIPE CARRIER SIDE, MI.
U-3801.



TOP ROLLER PIN, GI.
U-3802.



U-3803 - ASSEMBLY
SCALE: 3" = 1'-0"

N.Y.C.R.R.

SIGNAL DEPARTMENT.

PIPE CARRIER.

SCALE: HALF SIZE. ALBANY, APRIL 2ND 1915.

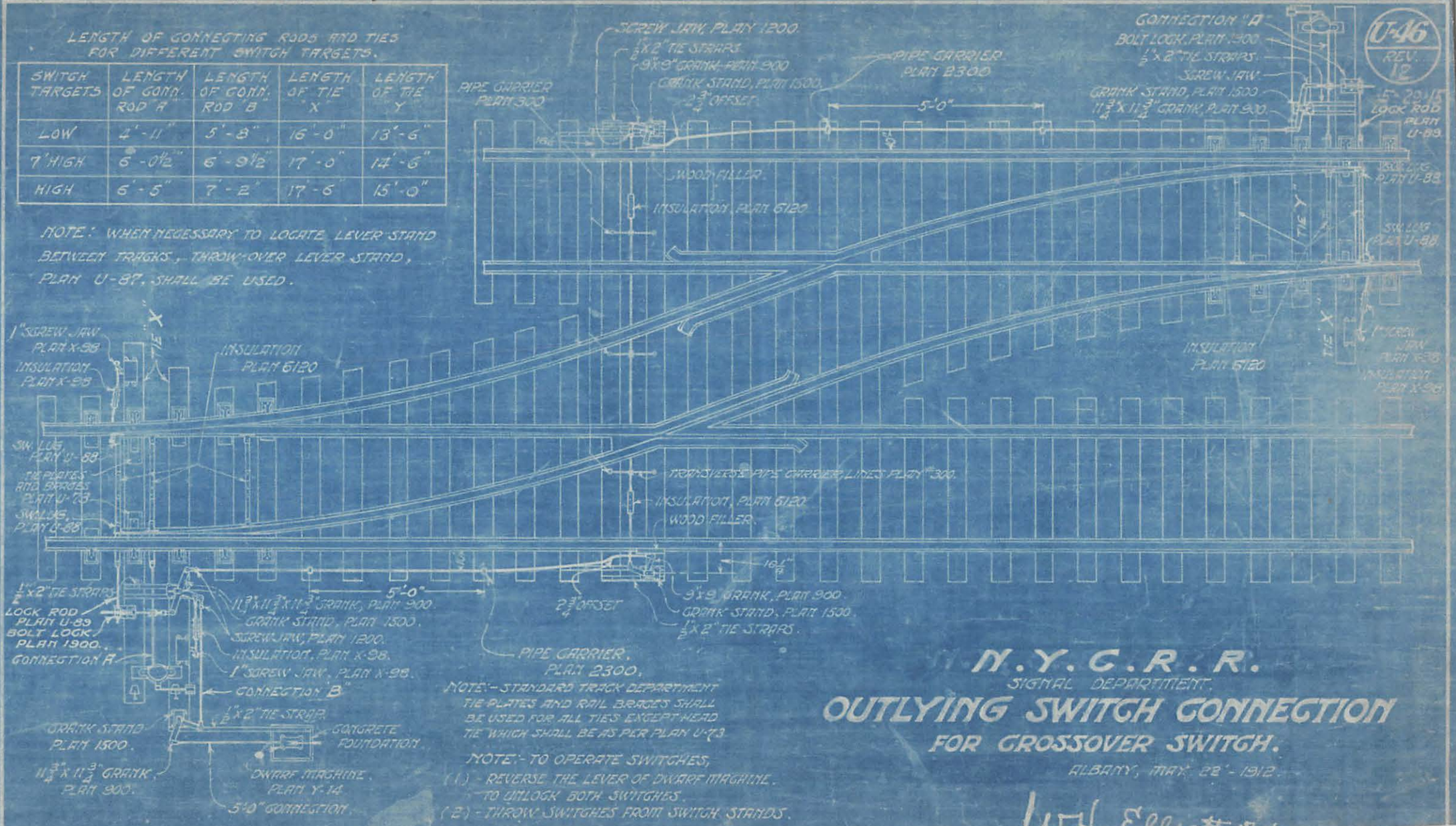
W. H. Elliott. 11/13/15

U-46
REV. 12

LENGTH OF CONNECTING RODS AND TIES FOR DIFFERENT SWITCH TARGETS.

SWITCH TARGETS	LENGTH OF CONN. ROD 'A'	LENGTH OF CONN. ROD 'B'	LENGTH OF TIE 'X'	LENGTH OF TIE 'Y'
LOW	4'-11"	5'-8"	16'-0"	13'-6"
7" HIGH	6'-0½"	6'-9½"	17'-0"	14'-6"
HIGH	6'-5"	7'-2"	17'-6"	15'-0"

NOTE:- WHEN NECESSARY TO LOCATE LEVER STAND BETWEEN TRACKS, THROW-OVER LEVER STAND, PLAN U-87, SHALL BE USED.



NOTE:- STANDARD TRACK DEPARTMENT TIE PLATES AND RAIL BRACES SHALL BE USED FOR ALL TIES EXCEPT HEAD TIE WHICH SHALL BE AS PER PLAN U-73.

NOTE:- TO OPERATE SWITCHES,
(1) - REVERSE THE LEVER OF DWARF MACHINE. TO UNLOCK BOTH SWITCHES.
(2) - THROW SWITCHES FROM SWITCH STANDS.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

OUTLYING SWITCH CONNECTION FOR CROSSOVER SWITCH.

ALBANY, MAY 28'-1912.

W.H. Elliott Sig'l

REC'D
JUN
8
1915
THE U. S. S. & B. CO.
SWISSVALE, PA.

JUN 8 15
U.S.S.B.CO.

NOTE

WHEN PRACTICABLE LEVER STAND SHALL BE PLACED AT RIGHT ANGLES WITH LINE OF TRACKS AND CRANKS ON FOUNDATION SHALL BE DISPENSED WITH. ARRANGEMENT THEN AS SHOWN BY DOTTED LINES.

THE TWO SIGNAL BARS OF BOLT LOCK TO BE BEVELLED ON OPPOSITE SIDES TO PREVENT BAR FROM ENTERING THE WRONG NOTCH IN LOCK ROD.

LEVER 3 LOCKS 2 REVERSED
LEVER 2 LOCKS 1 REVERSED

TO OPERATE SWITCH & DERAIL:

(1) - THROW LEVER 1 TO UNLOCK SWITCH
(2) - " " 2 TO CLOSE DERAIL
(3) - " " SWITCH FRONT SWITCH STAND
(4) - " " LEVER 3 TO LOCK SWITCH REVERSED. LOCK DERAIL REVERSED & THROW TARGET.

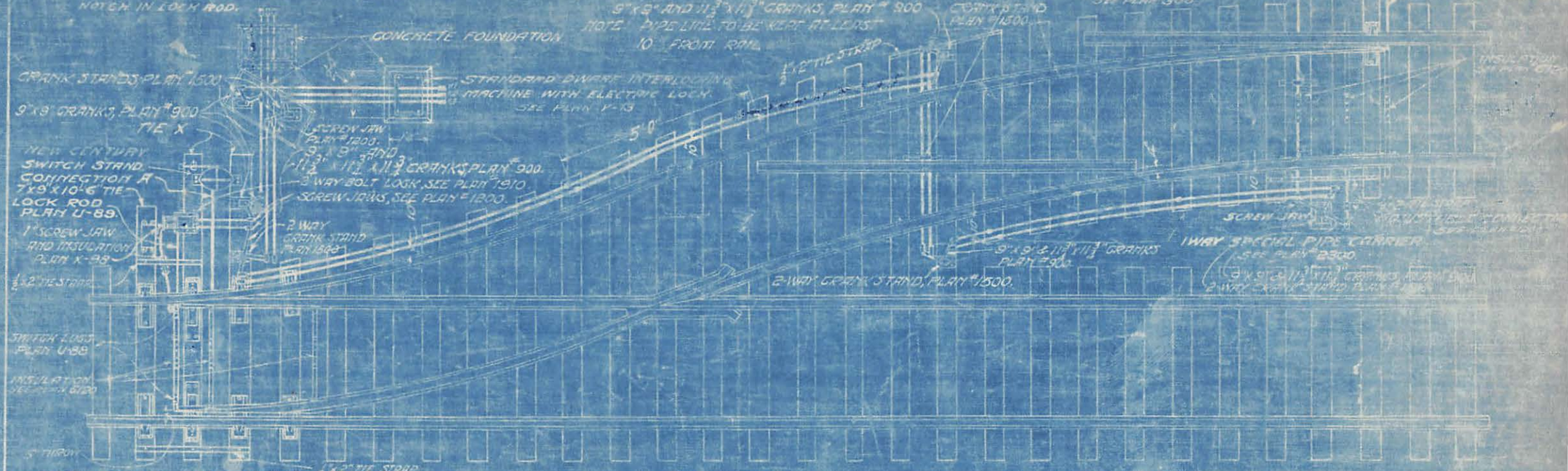
9"x8" AND 11 3/4"x11 3/4" CRANKS, PLAN # 900
NOTE: PIPE LINE TO BE KEPT AT LEAST 10' FROM RAIL

NOTE-DAY INDICATION OF TARGET.
RED: WHEN SET TO DERAIL
YELLOW: " DERAIL IS CLEAR OF RAILS

NIGHT INDICATION
PURPLE: WHEN SET TO DERAIL
YELLOW: " DERAIL IS CLEAR OF RAIL

DERAIL TARGET PLAN # 1100

U-97 REV


CONCRETE FOUNDATION
CRANK STANDS, PLAN # 1500
9"x8" CRANKS, PLAN # 900
TIE X
NEW CENTURY SWITCH STAND CONNECTION A
7'9"x10'6" TIE
LOCK ROD PLAN U-89.
1" SCREW JAW AND INSULATION PLAN X-98
SCREW JAW PLAN # 1200.
9"x8" AND 11 3/4"x11 3/4" CRANKS, PLAN # 900.
3 WAY BOLT LOCK, SEE PLAN # 1910
SCREW JAWS, SEE PLAN # 1200.
2 WAY CRANK STAND PLAN 1500
STANDARD DWARF INTERLOCKING MACHINE WITH ELECTRIC LOCK. SEE PLAN Y-13
5'0"
2-WAY CRANK STAND PLAN # 1500
2-WAY GRANK STAND, PLAN # 1500.
9"x9" & 11 3/4"x11 3/4" CRANKS PLAN # 900
SCREW JAW
1 WAY SPECIAL PIPE CARRIER SEE PLAN # 2300
SWITCH LOCK PLAN U-88
INSULATION
3" THROW
5/8"x2" TIE STRAP
N.Y.C. STANDARD TRANSVERSE PIPE CARRIER SEE PLAN # 300
BOLT LOCK PLAN 19
LOCK ROD PLAN U-

NOTE: DAY INDICATION OF TARGET
RED: WHEN SWITCH IS SET FOR SIDING
GREEN: " " " MAIN LINE

NIGHT INDICATION.
RED: WHEN SWITCH IS SET FOR SIDING
GREEN: " " " MAIN LINE

LENGTH OF CONNECTING RODS AND TIES FOR DIFFERENT SWITCH TARGETS.

SWITCH TARGETS	LENGTH OF CONN. ROD R	LENGTH OF TIE X
LOW	4'-11"	13'6"
DEPT. HIGH	6'-0 1/8"	14'6"
HIGH	6'-5"	15'0"

NOTE: WHERE ELECTRIC CONTROL IS NOT TO BE PROVIDED, ELECTRIC LOCK ON DWARF MACHINE SHOULD BE OMITTED.

STANDARD TRACK DEPARTMENT TIE PLATES AND RAIL BRACES SHALL BE USED FOR ALL TIES EXCEPT HEAD TIE, WHICH SHALL BE AS PER PLAN U-73.

N.Y.C. & H.R.R.R.

SIGNAL DEPT. - EXTERIOR ZONE

OUTLYING SWITCH CONNECTION

DERAIL & SWITCH

NEW YORK - 3-6-08

W.H. Elliott. 9/12/08.

SIGNAL ENGINEER

NOTE:

WHEN PANTOGRAPH LEVER STAND SHALL BE PLACED AT RIGHT ANGLES WITH LINE OF TRACKS AND CRANKS ON FOUNDATION SHALL BE DISPENSED WITH, ARRANGEMENT THEN AS SHOWN BY DOTTED LINES.

THE TWO SIGNAL BARS OF BOLT LOCK TO BE BEVELLED ON OPPOSITE SIDES TO PREVENT BAR FROM ENTERING THE WRONG NOTCH IN LOCK ROD.

LEVER 3 LOCKS 2 REVERSED
LEVER 2 LOCKS 1 REVERSED

TO OPERATE SWITCH & DERAIL:

(1) - THROW LEVER 1 TO UNLOCK SWITCH
(2) - " 2 TO CLOSE DERAIL
(3) - " SWITCH FROM OPPOSITE STAND
(4) - " LEVER 3 TO LOCK SWITCH REVERSED
LOCK DERAIL RELEASED IN FRONT TARGET.

9"x9" AND 11 3/4"x11 3/4" CRANKS, PLAN # 900
NOTE: PIPE LINE TO BE KEPT AT LEAST 10' FROM RAIL

NOTE - DAY INDICATION OF TARGET
RED: WHEN SET TO DERAIL
YELLOW: " DERAIL IS CLEAR OF RAIL.

NIGHT INDICATION
PURPLE: WHEN SET TO DERAIL.
YELLOW: " DERAIL IS CLEAR OF RAIL

DERAIL TARGET PLAN # 188

U-A RAIL

SCREW JAW

N.Y.C. STANDARD TRANSVERSE PIPE CARRIER SEE PLAN # 900

BOLT LOCK PLAN U-
LOCK ROD PLAN U-

2-WAY CRANK STAND PLAN # 1500

CONCRETE FOUNDATION

CRANK STANDS PLAN # 1500

9"x9" CRANKS, PLAN # 900
TIE X

STANDARD DWARF INTERLOCKING MACHINE WITH ELECTRIC LOCK SEE PLAN Y-13

1/2 x 8" TIE STRAP

5'-0"

NEW CENTURY SWITCH STAND CONNECTION A 7'x9"x10'-6" TIE

LOCK ROD PLAN U-89.

1" SCREW JAW AND INSULATION PLAN X-99

SCREW JAW PLAN # 1800.
9"x9" AND 11 3/4"x11 3/4" CRANKS PLAN # 900.
2 WAY BOLT LOCK, SEE PLAN # 1910
SCREW JAWS, SEE PLAN # 1800.

2 WAY CRANK STAND PLAN 1500

1/2 x 8" TIE STRAP

SWITCH LOCK PLAN U-88

INSULATION SEE PLAN X-100

5" THROW

1/2 x 8" TIE STRAP

2-WAY CRANK STAND, PLAN # 1500.

9"x9" & 11 3/4"x11 3/4" CRANKS PLAN # 900

1 WAY SPECIAL PIPE CARRIER SEE PLAN # 2300.

SCREW JAW

NOTE - DAY INDICATION OF TARGET
RED WHEN SWITCH IS SET FOR SIDING
GREEN " " MAIN LINE.

NIGHT INDICATION.
RED: WHEN SWITCH IS SET FOR SIDING
GREEN " " MAIN LINE.

LENGTH OF CONNECTING RODS AND TIES FOR DIFFERENT SWITCH TARGETS.

SWITCH TARGETS	LENGTH OF CONN. ROD R	LENGTH OF TIE X
LOW	2'-11"	13'-6"
1FT. HIGH	6'-0 1/2"	14'-6"
HIGH	6'-5"	15'-0"

NOTE: WHERE ELECTRIC CONTROL IS NOT TO BE PROVIDED, ELECTRIC LOCK ON DWARF MACHINE SHOULD BE OMITTED.

STANDARD TRACK DEPARTMENT TIE PLATES AND RAIL BRACES SHALL BE USED FOR ALL TIES EXCEPT HEAD TIE, WHICH SHALL BE AS PER PLAN U-73.

N.Y.C. & H.R.R.R.

SIGNAL DEPT. - EXTERIOR ZONE

OUTLYING SWITCH CONNECTION

DERAIL & SWITCH

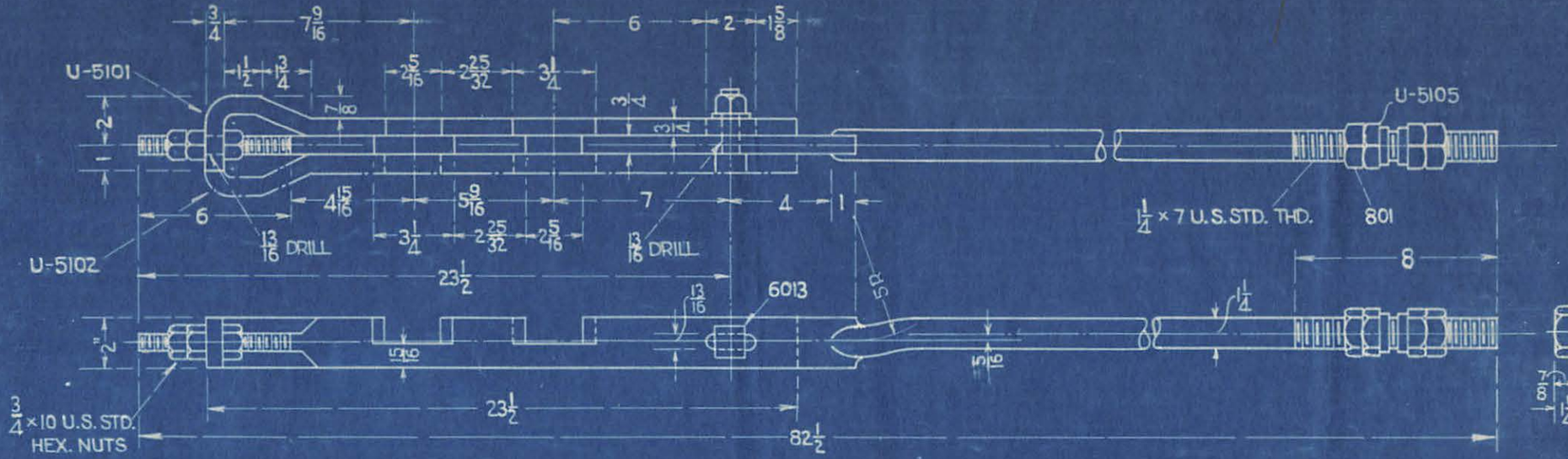
NEW YORK - 3-6-08

W.H. Elliott 3/13/08.

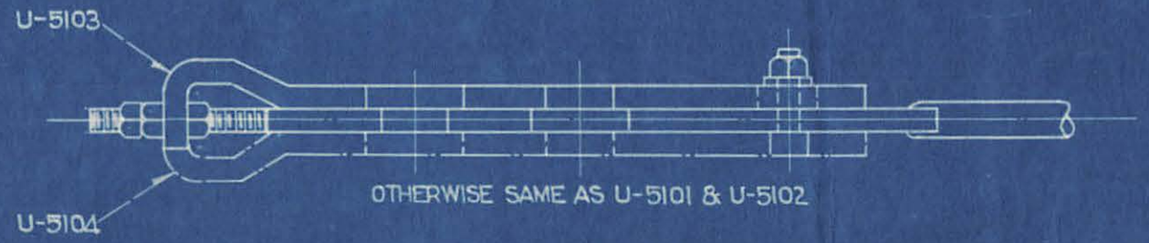
SIGNAL ENGINEER

U-51

8-15-30

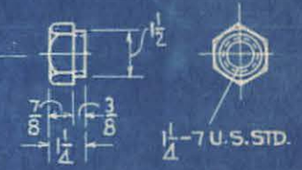


U-5101 LOCK ROD COMPL. SINGLE SWITCH R.H. CLOSED POINT SIDE
U-5102 " " " " " L.H. " " "
O.H. STEEL



OTHERWISE SAME AS U-5101 & U-5102

U-5103 LOCK ROD COMPL SINGLE SWITCH R.H. OPEN POINT SIDE
U-5104 " " " " " L.H. " " "



U-5105 NUT

0 3 6 9 12
SCALE OF INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

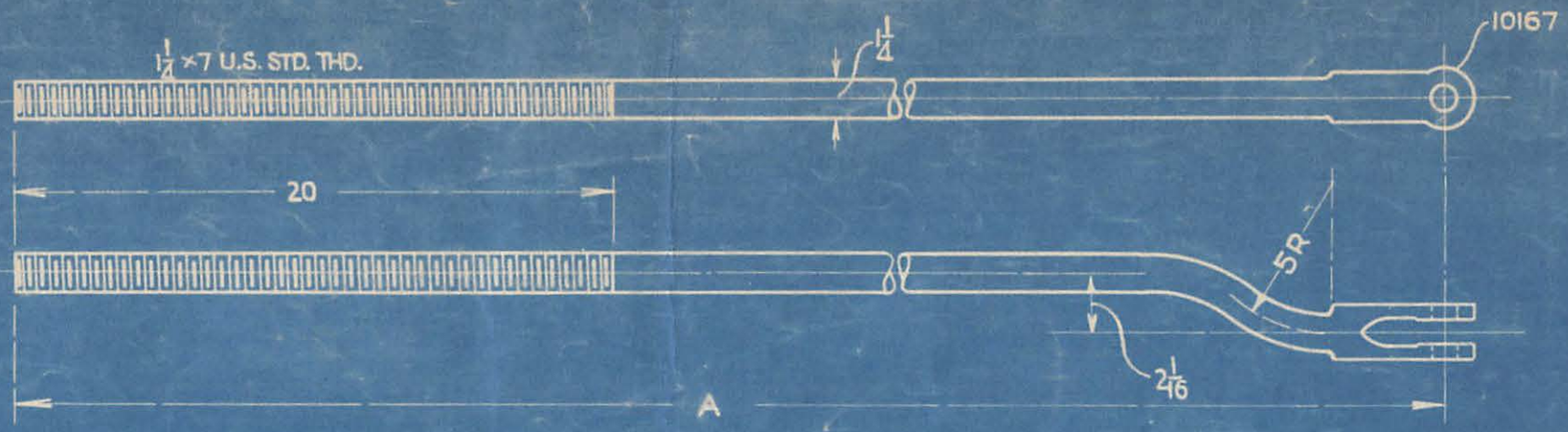
LOCK RODS

105 LB. RAIL G.R.S. MODEL 4A

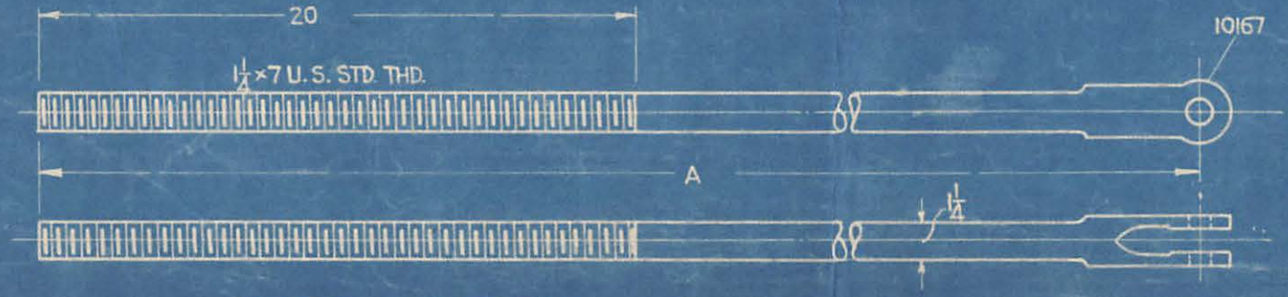
ALBANY AUG. 15, 1930.

W. H. Elliott 9/3/30

U52
REV. 2
3-23-31



U-5201 THROW ROD SINGLE SWITCH A = 57
U-5202 " " DOUBLE SLIP A = 45
O.H. STEEL



U-5203 THROW ROD M.P. FROG A = 71
U-5204 " " " " A = 108½
U-5205 " " SINGLE SL. A = 57
O.H. STEEL

0 3 6 9 12
SCALE OF INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

THROW ROD

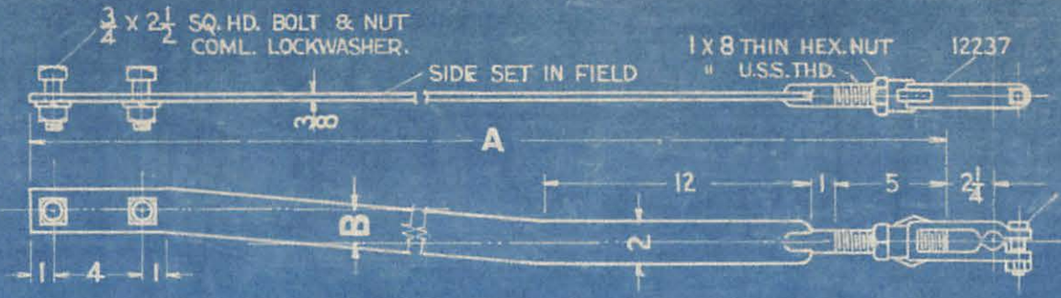
105 LB. RAIL G.R.S. MODEL 4A

ALBANY AUG. 15, 1930.

W. H. Elliott 9/3/30.
SIGNAL ENGR.

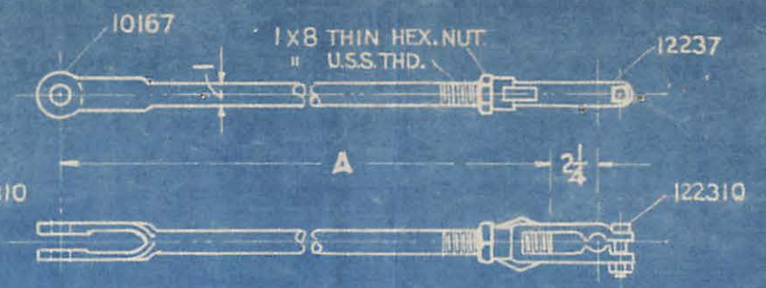
DEPT. 47
APR 5 1931
U. S. CO.

U-53
REV. 2
11-11-31



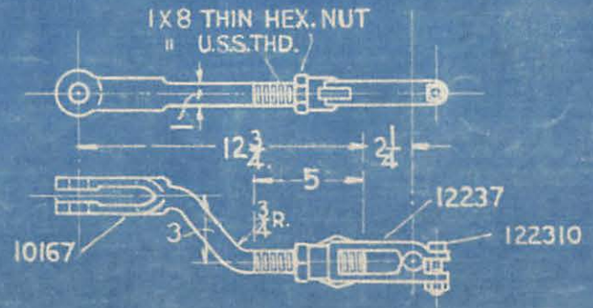
ROD COMPL. O.H. STEEL.

U-5301	FOR S-1, S-12	A = 35 1/2	B = 2 3/4
U-5302	" S-2, S-8	A = 32 1/2	B = 3 7/16
U-5303	" S-3.	A = 52 3/4	B = 3 1/16
U-5304	" S-4, S-15	A = 53	B = 1 1/16
U-5305	" S-24, S-21	A = 56 3/4	B = 1 1/16
U-5307	" S-7, S-16	A = 35 1/2	B = 1 3/4
U-5308	" S-9	A = 52 3/4	B = 2 1/16
U-5309	" S-10, S-11	A = 35 1/2	B = 3 5/16
U-5310	" S-22, S-23	A = 64 3/4	B = 1 1/16



ROD COMPL. O.H. STEEL.

U-5311	FOR S-22, S-23	A = 22
U-5312	FOR S-13, S-17	A = 47
U-5313	FOR S-14.	A = 50



U-5306, ROD COMPL. FOR S-24
O.H. STEEL

0 3 6 9 12 24
SCALE OF INCHES

105 AND 127 LB. RAIL

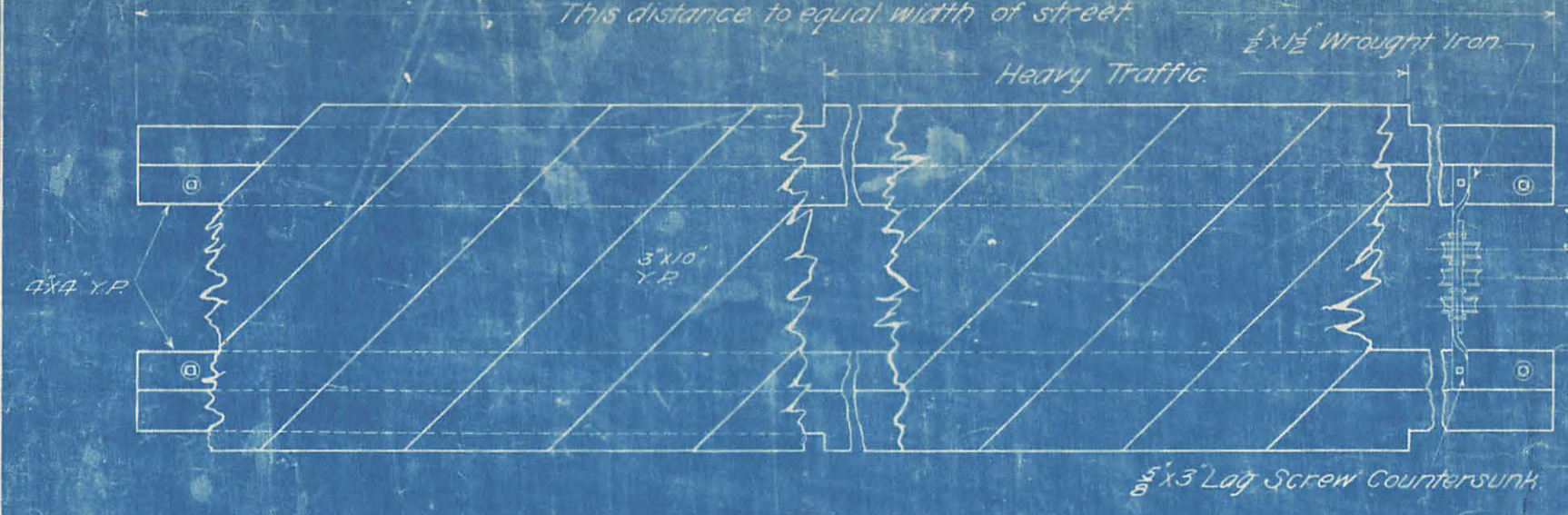
N. Y. C. R. R.
SIGNAL DEPT.- BUFFALO AND EAST

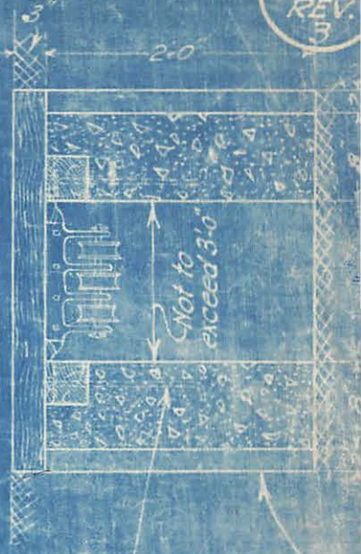
SW. CCT. CONTROLLER RODS

ALBANY. AUG. 15-1930.

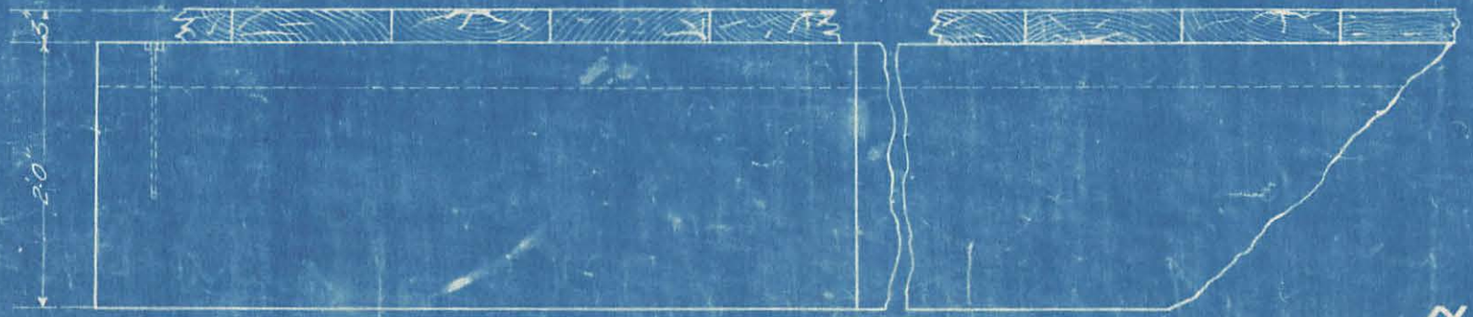
W. H. Ellis 11/6/32.
SIGNAL ENGR.

U-54
REV. 3





Width required for streets where there is heavy traffic.



NOTE

Walls of subway to be made of class 'D' concrete Anchor bolts to be spaced 7' apart. Width of subway to be determined by number of pipe carriers to be protected, allowing 2¾" for each carrier.

When placed on yielding soil, width of concrete side walls to be doubled at bottom to provide ample foundation to prevent settling.

N.Y.C. & H.R.R.R.

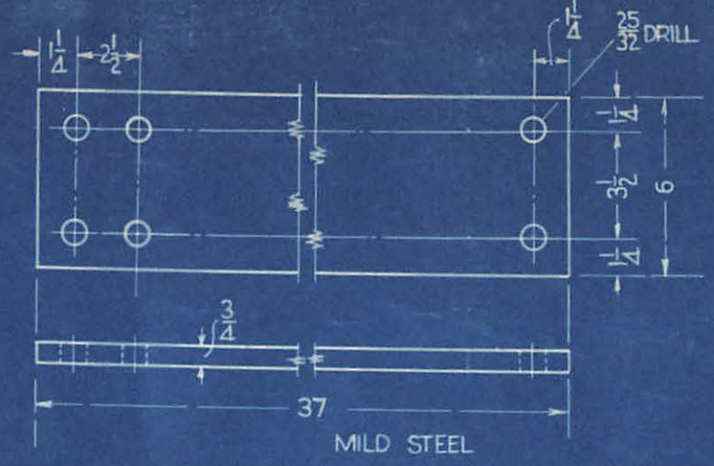
STANDARD CONCRETE SUBWAY

FOR PIPES UNDER HIGHWAY CROSSING.

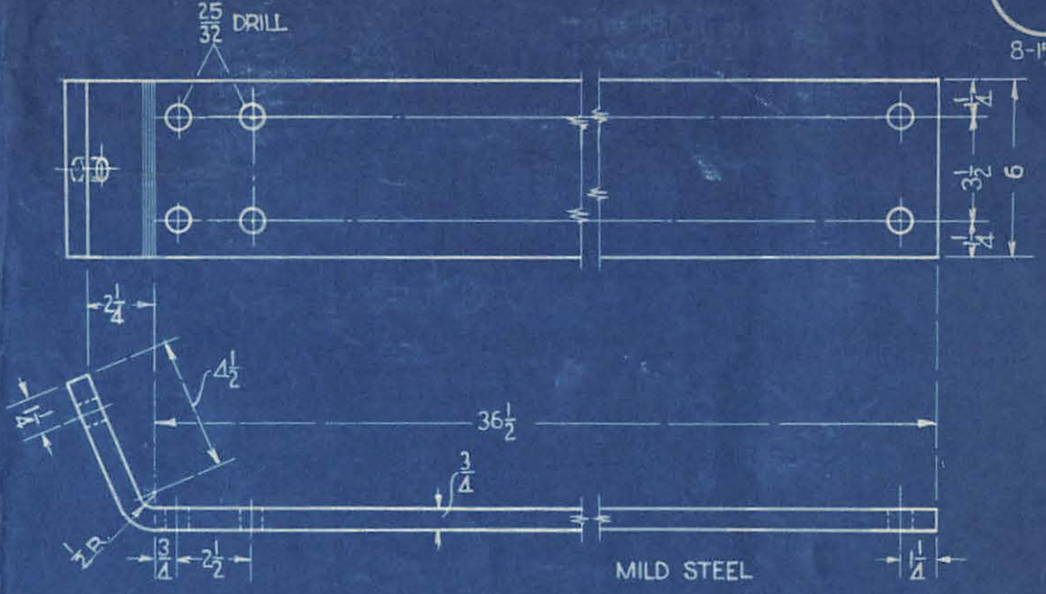
SCALE 3" = 1' NEW YORK FEB 6 1907 E.J.C.

W.H. Elliott 11/11/07

SIGNAL ENGINEER.



U 5501 TIE PLATE SINGLE SW.



U 5502 TIE PLATE SINGLE SW.

U-55

8-15-30

0 3 6 9 12

SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPARTMENT

TIE PLATES

105 & 127 LB. RAIL G.R.S. MODEL 4A

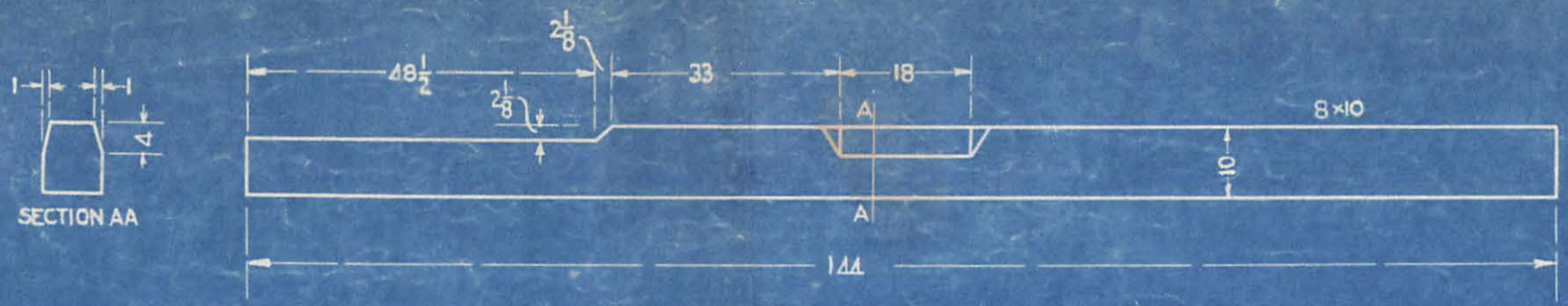
ALBANY AUG. 15, 1930.

W. H. Elliott. 9/3/30

SIGNAL ENGR.

OCT 25 1930
A. M.
NOTE
ATTENTION
Ans'd.....
Date .....

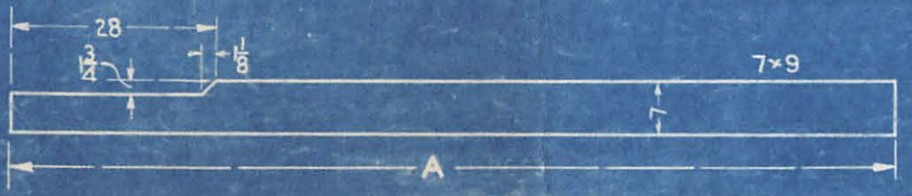
OCT 25 19
A. M.
NOTE
ATTENTION
Ans'd.....
Date .....



U-5601 SINGLE SWITCH

U-5602 SINGLE SWITCH

NOTE: TIES SHALL BE CREOSOTED AFTER FRAMING



U-5603 SINGLE SWITCH A = 120
U-5604 " " A = 138 WITH THIRD RAIL BRACKET

0 3 6 9 12
SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPARTMENT

TIE FRAMING

105 LB. RAIL G.R.S. MODEL 4A

ALBANY AUG. 15, 1930.

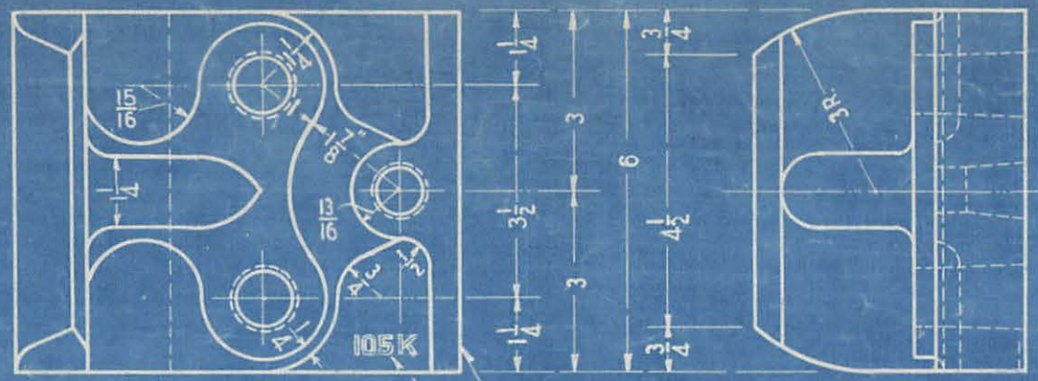
W. H. Elliott 9/3/30.

SIGNAL ENGR.

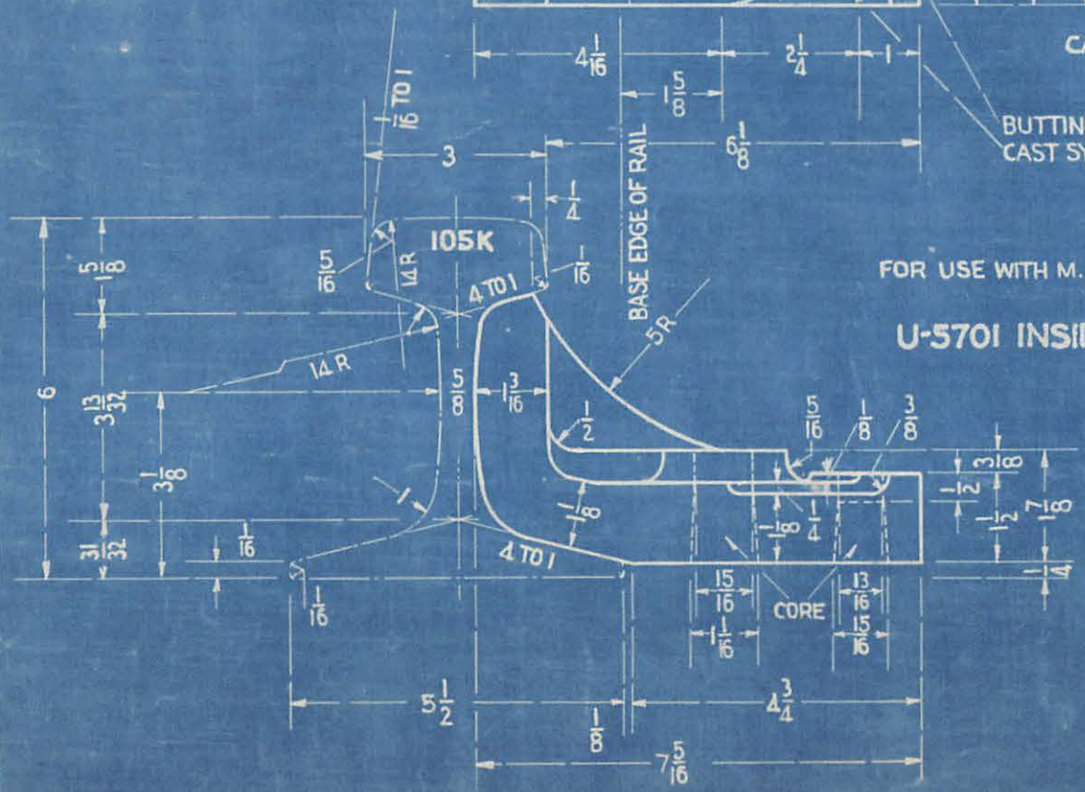
DEPT. OF
APR 13
1931
A.M. P.M.
12 1 2 3 4 5 6 7 8 9 10 11 12
00.

U-57

8-28-28



BUTTING EDGE TO BE CHILLED
CAST SYMBOL GIVING WEIGHT AND SECTION OF RAIL



FOR USE WITH M. OF W. TIE PLATES EC.-H 23

U-5701 INSIDE RAIL BRACE

SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPARTMENT

INSIDE RAIL BRACE

105LB. RAIL DUDLEY SECTION

ALBANY AUG. 28, 1928.

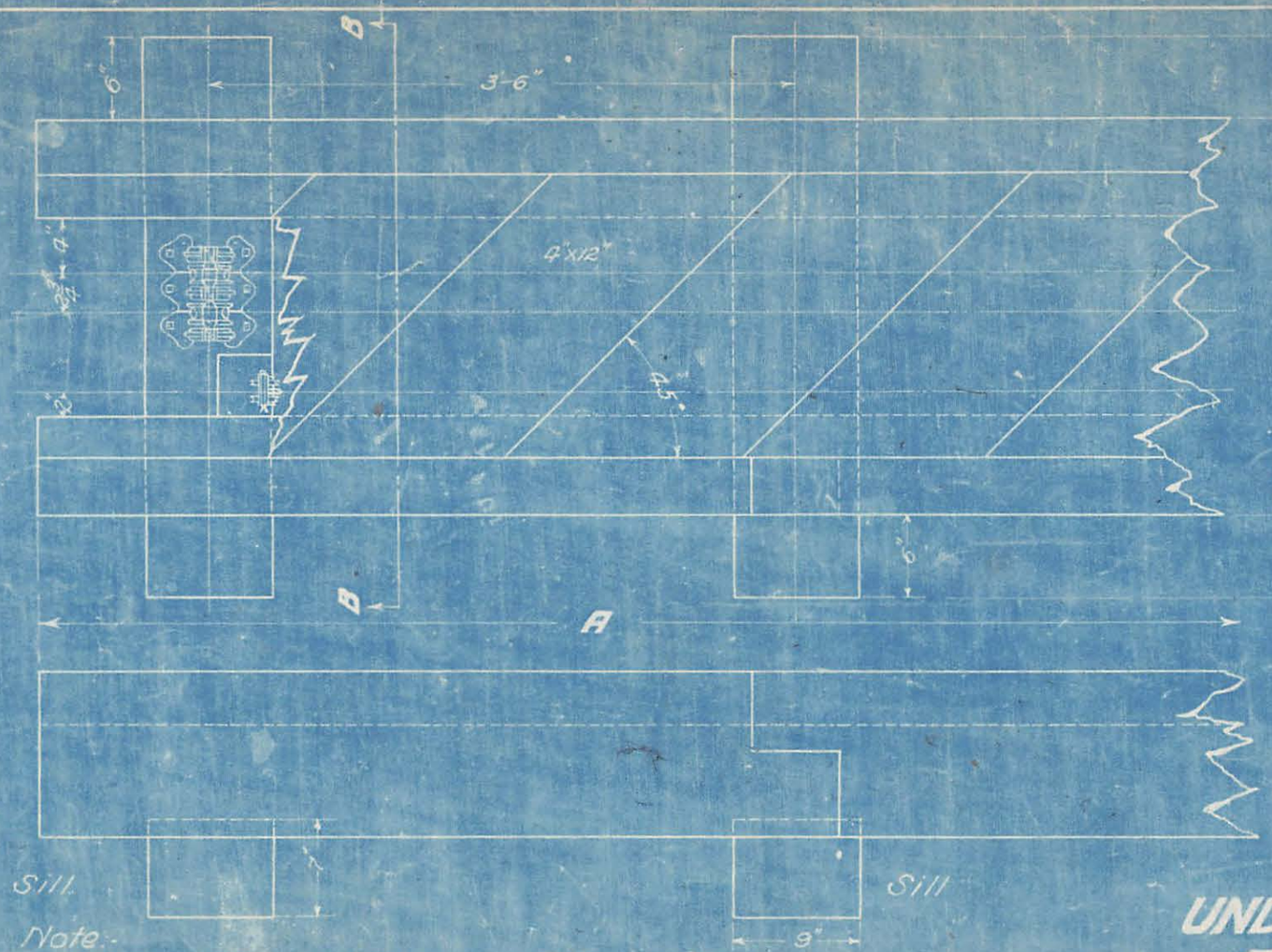
W. H. Elliott 10/11/28.

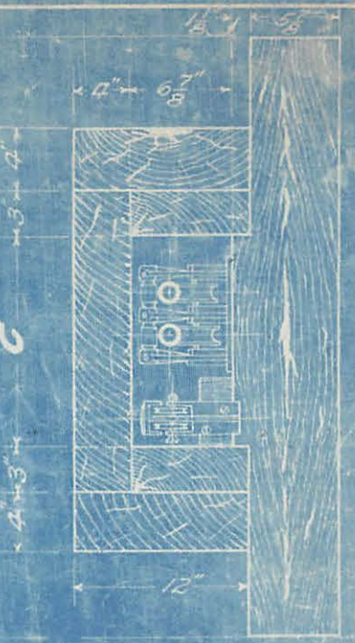
SIGNAL ENGR.

OCT 24 1930
A. M.
NOTE
ATTENTION
Ans'd
Date

DEPT. OF AGR.
OCT 24
1930

U-66
ISSUE
N° 1





Section at B-B.

Note:-
All planking to be of yellow pine or oak.
"A" - Width of street to determine length of boxing.
"C" - Width of boxing to be determined by number of wire and pipe carriers to be protected. Allow 2½" for each wire carrier; allow 5½" for each one-way pipe carrier, 8" for two-way pipe carrier, 11" for three-way pipe carrier.

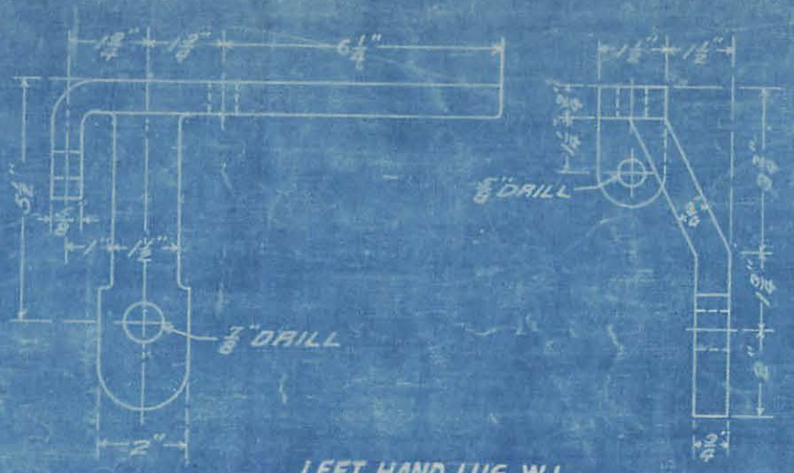
N.Y.C. & H.R.R.R.
STANDARD BOXING UNDER HIGHWAY CROSSINGS TO PROTECT PIPES & WIRES.

Scale-1"=1' New York, Nov. 12, 07, N.Y.

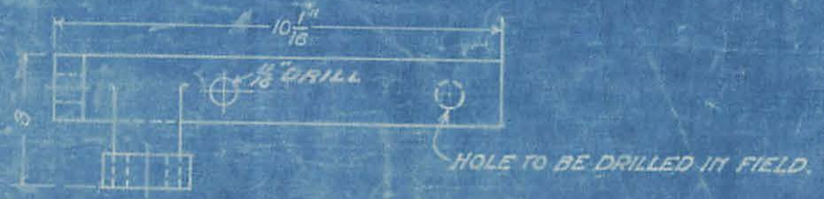
Engr. Of Signals.

U-67
REV. 2

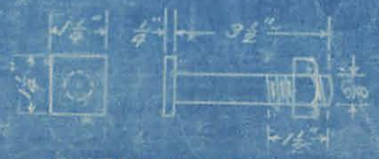
5-9-17



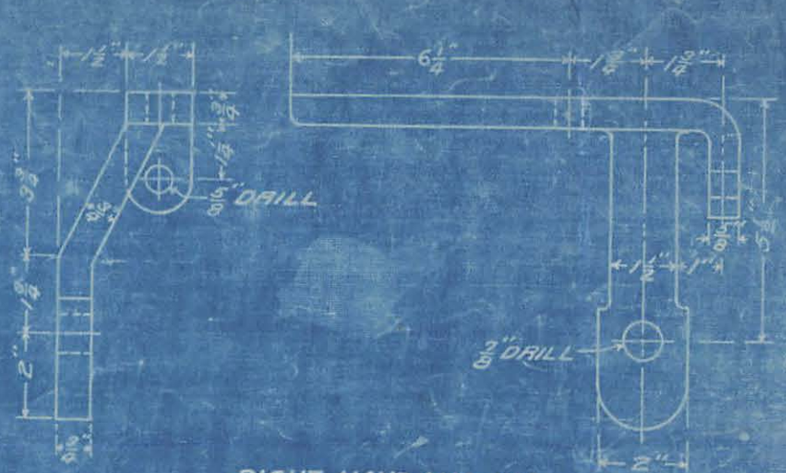
LEFT HAND LUG W.I.
U-6701



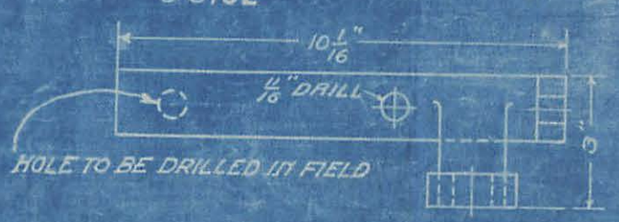
SWITCH LUG BOLT
FOR POINTS NOT RE INFORCED
U-6703



SWITCH LUG BOLT
FOR POINTS RE-INFORCED
U-6704



RIGHT HAND LUG W.I.
U-6702



N.Y.C.R.R.
SINGLE SWITCH LUGS & CIRCUIT CONTROLLER CONNECTIONS

SCALE: 3" = 1'-0" N.Y. 1-31-08.

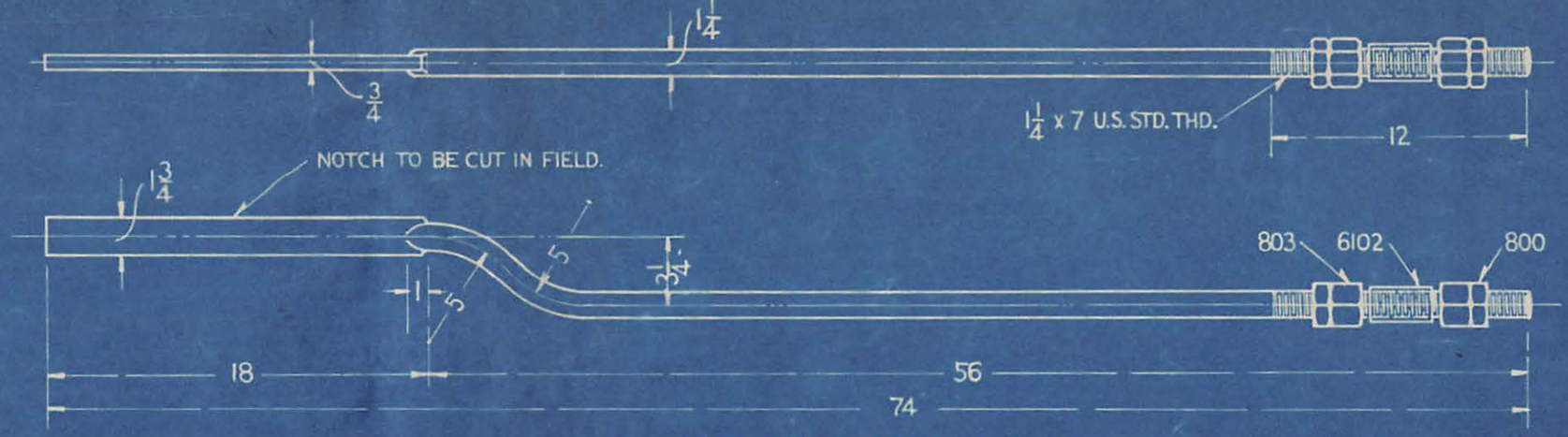
W. H. Ernst 2/10/18.
SIGNAL ENGINEER.

RECEIVED
MAY 23 1917
Union Switch & Signal Co.
80 CHURCH ST., N. Y.

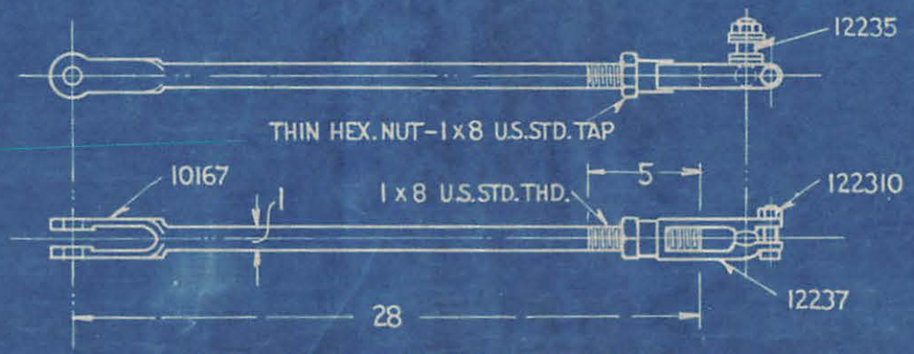
RECEIVED
MAY 24 1917
EST. DEPT.

RECD
MAY
24
1917
THE U. S. S. & S. CO.
SWISSVALE, PA.

U-72
REV. 6
7-26-2



U-7201 LOCK ROD. O.H. STEEL



U-7202 CIRCUIT CONTROLLER ROD. O.H. STEEL
OFFSET IN FIELD AS REQ'D.

0 3 6 9 12 24
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK FITTINGS

ALBANY, FEB. 21 – 1917

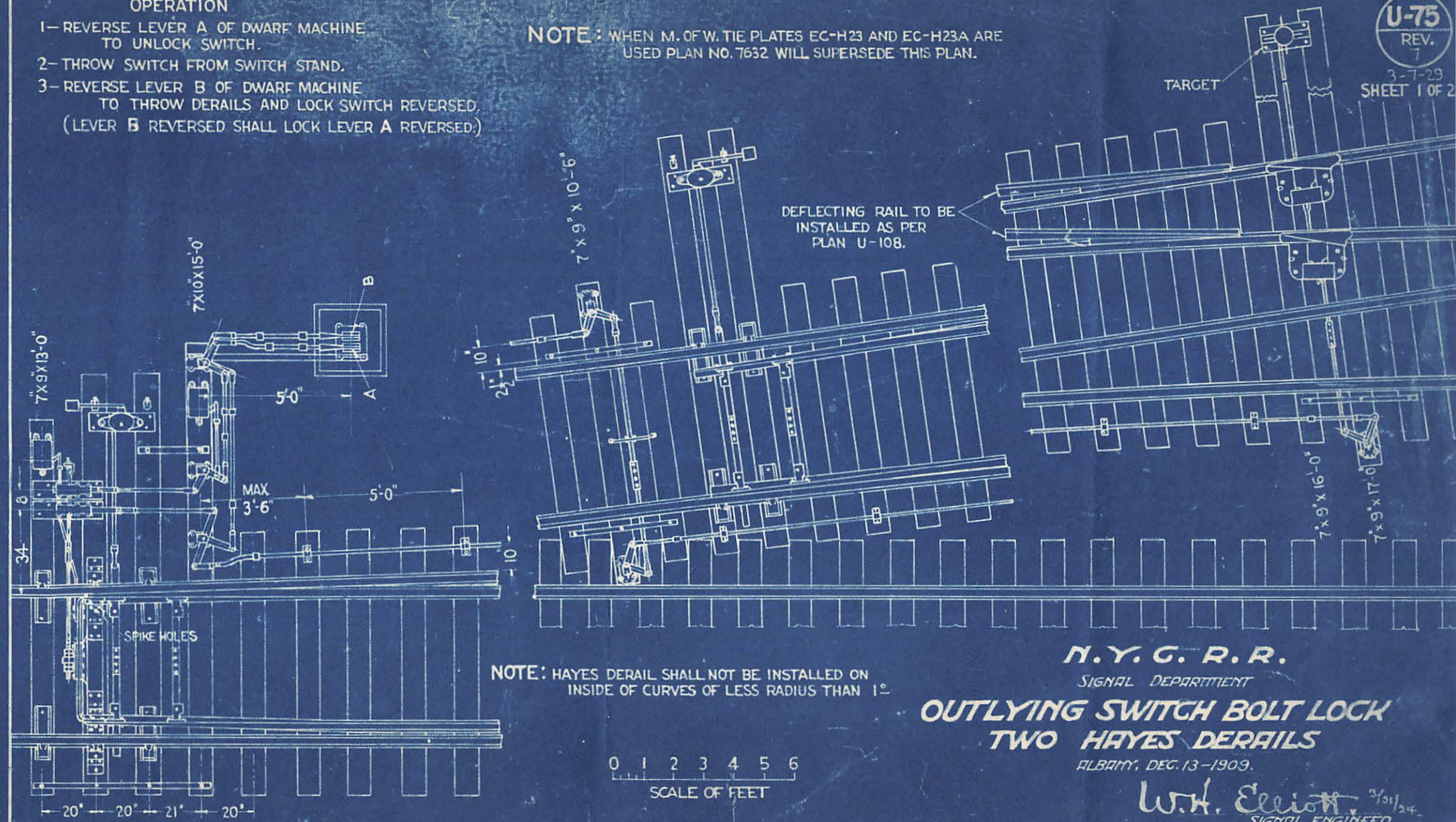
W. H. Elliott 7/27/25
SIGNAL ENGINEER

U-75
REV. 7
3-7-29
SHEET 1 OF 2

OPERATION

1— REVERSE LEVER A OF DWARF MACHINE TO UNLOCK SWITCH.
2— THROW SWITCH FROM SWITCH STAND.
3— REVERSE LEVER B OF DWARF MACHINE TO THROW DERAILS AND LOCK SWITCH REVERSED.
(LEVER B REVERSED SHALL LOCK LEVER A REVERSED.)

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7632 WILL SUPERSEDE THIS PLAN.



NOTE: HAYES DERAIL SHALL NOT BE INSTALLED ON INSIDE OF CURVES OF LESS RADIUS THAN 1°

0 1 2 3 4 5 6
SCALE OF FEET

N. Y. C. R. R.
SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK TWO HAYES DERAILS

ALBANY, DEC. 13-1909.

W. H. Elliott 3/31/24
SIGNAL ENGINEER.

NAME	REF.	REQ'D.
FRONT ROD	4116-A	1
LOCK ROD COMPL. WITHOUT 6102	U-7203	1
PLUNGER STAND COMPL.	14253	2
PLUNGER LOCK CONN. ROD COMPL. (36 3/4 LONG)	5960-2	2
TIE PLATE	5940-6	2
RISER PLATE	5940-14	2
PLUNGER LOCK PLATE	5940-8	2
BUTT STRAP	5940-17	2
STRAP NUT	5940-13	2
TIE STRAP	5940-2	3
" " 16 FT. LONG (LEVER STAND & TIES)	5940	1
CRANK STAND COMPL. 2 WAY. WITH 9" & 11 3/4" CRANKS	10119	1
CRANK STAND COMPL. WITH 11 3/4 T-CRANK	10111	1
CRANK 9" x 9"	10075	1
CRANK STAND COMPL.	10082	4
CRANK R.H.	5840-8	1
" L.H.	5840-7	2
TRANSVERSE PIPE CARRIER	10721	1
STRAP " "	10714	35
PIPE, COUPLING AND PLUG WITH RIVET	1015	200 FT.
STRAIGHT TANG END SOLID JAW	10181	6
" " " SCREW JAW (OFFSET IN FIELD)	13605	2
" " " " "	10199	4
DERAIL, HAYES MODEL HP, SIZE 6	R.H. OR L.H.	2
DERAIL ROD COMPL.	5840-6	1
" " " (USE PLUNGER LOCK CONN. ROD)	5960-2	1
TARGET STAND AND LAMP COMPL.	5850-10	1
TARGET ROD COMPL.	5850-9	1
CROSS ROD COMPL.	5840-5	1
RAIL BRACE	2920-1	2
SW. CCT. CONTROLLER. HALL 2 POS. STYLE G-2		2
SW. CCT. CONTROLLER ROD, (68 3/4 LONG)	4117	1
" " " "	U-7204	1

NAME	REF.	REQ'D.
BOLT SQ. HD. WITH HEX. NUT 3/4 x 3 1/2" (SW. LUG)		4
" " " " 3/4" x 2 3/4" (DW. MACH.)		2
" " " " 3/4" x 3 1/4" "		2
		1
		2
		2
BOLT SQ. HD. AND NUT 3/4" x 2 1/2" (P.L. PL.)		8
" " " " 3/4" x 9 1/2" (CRANK STD.)		12
" " " " 7/8" x 3 3/4" (STRAP NUT)		4
SPIKE (DERAIL)		4
WASHER 7/8" COML. LOCK (RAIL BRACE BOLT)		4
" 3/4" " " (SW. LUG BOLT)		4
" C.I. (CRANK STAND)	14581	12
PIN (1 1/4" JAW CONNECTION)	10105	23
COTTER 3/16" x 1 1/2" (JAW PIN)		23
" 3/16" x 1 1/4" (3/4" SW. LUG BOLT)		4
LAG SCREW 3/4" x 8" (RAIL BRACE)		2
" " 3/4" x 6" (TIE & P.L. PL. TIE STRAP CCT. CONT., CRANK STAND, DERAIL)		57
" " 3/4" x 4" (TRANS. P.C.)		2
" " 1/2" x 3" (STRAP P.C.)		70
RIVET RD. HD. 3/4" x 3 1/4" (BUTT STRAP)		4
" CSK. HD. 3/4" x 1 3/4" (RISER PL.)		6
DWARF MACHINE		1
FOUNDATION		1
TIMBERS 7" x 9" x 10'-6" B.M. 55.125		1
7" x 9" x 13'-0" 68.25		1
7" x 9" x 16'-0" 84.00		1
7" x 9" x 17'-0" 89.25		1
7" x 10" x 15'-0" 87.50		1
TOTAL F.B.M. 384.125		
DEFLECTING RAIL	U-108	2

U-75
REV. 7
3-7-29
SHEET 2 OF 2

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7632 WILL SUPERSEDE THIS PLAN.

N. Y. C. R. R.
SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK TWO HAYES DERAILS

ALBANY, DEC. 13 - 1909.

W. H. Elliott. 3/31/24
SIGNAL ENGINEER.

DEPT. OF AG
MAY 11 1929
U. S. & S. CO.

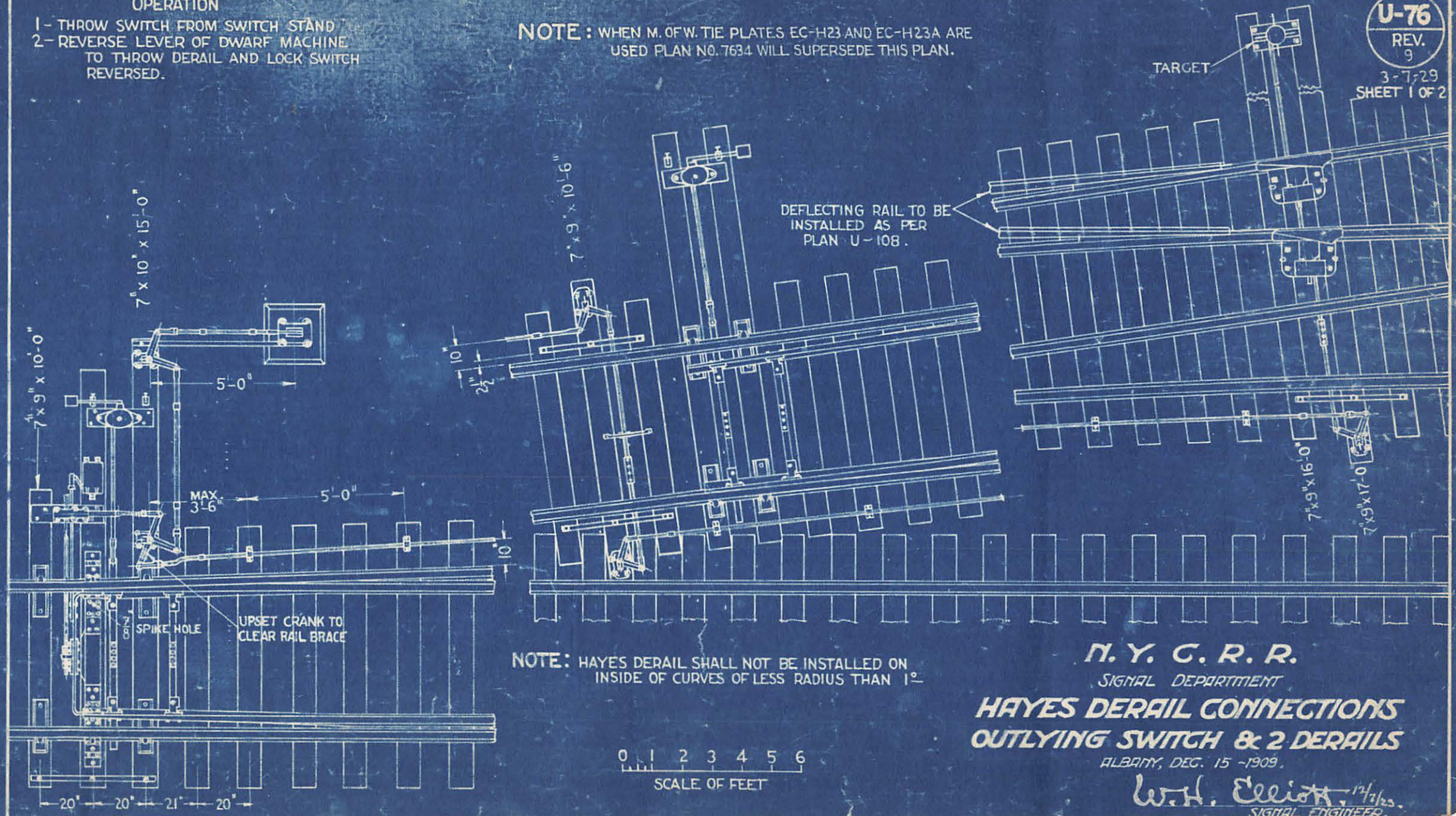
MAY 11 1929
A. M.
NOTE ATTENTION
Ans'd
Date

U-76
REV. 9
3-7-29
SHEET 1 OF 2

OPERATION

1- THROW SWITCH FROM SWITCH STAND
2- REVERSE LEVER OF DWARF MACHINE TO THROW DERAIL AND LOCK SWITCH REVERSED.

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7634 WILL SUPERSEDE THIS PLAN.



NOTE: HAYES DERAIL SHALL NOT BE INSTALLED ON INSIDE OF CURVES OF LESS RADIUS THAN 1°

0 1 2 3 4 5 6
SCALE OF FEET

N. Y. C. R. R.
SIGNAL DEPARTMENT

HAYES DERAIL CONNECTIONS OUTLYING SWITCH & 2 DERAILS

ALBANY, DEC. 15 -1909.

W. H. Elliott 12/7/25.
SIGNAL ENGINEER.

DEPT. AT
MAY
11
1929
U. S. A. S. CO.

NAME	REF.	REQ'D.
FRONT ROD	4116-A	1
LOCK ROD COMPLETE WITHOUT 6102	U-7201	1
PLUNGER STAND COMPLETE	14253	1
ADJUSTABLE LINK (C. TO C. 15½")	10198	1
TIE PLATE	5940-6	2
RISER PLATE	5940-14	2
PLUNGER LOCK PLATE	5940-8	1
BUTT STRAP	5940-17	2
STRAP NUT	5940-13	2
TIE STRAP	5940-2	4
" " -7 FT. " (LEVER STAND)	5940	1
CRANK STAND COMPL. WITH 11¾" x 11¾" CRANK	10116	1
" " " " 11¾" T CRANK	10111	1
CRANK, R.H.	5840-8	1
" L.H.	5840-7	2
CRANK STAND COMPL.	10082	3
TRANSVERSE PIPE CARRIER	10721	1
STRAP " "	10714	35
PIPE, COUPLING AND PLUG WITH RIVET	1015	200 FT.
STRAIGHT TANG END SOLID JAW	10181	4
" " " SCREW JAW (OFFSET IN FIELD)	13605	1
" " " " "	10199	3
DERAIL, HAYES MODEL HP, SIZE 6	R.H. OR L.H.	2
DERAIL ROD COMPL.	5840-6	1
" " " (USE PLUNGER LOCK CONN. ROD)	5960-2	1
TARGET STAND AND LAMP COMPL.	5850-10	1
TARGET ROD COMPL.	5850-9	1
CROSS ROD COMPL.	5840-5	1
RAIL BRACE	2920-1	2
SW. CCT. CONTROLLER, HALL 2 POS. STYLE G-2		1
SW. CCT. CONTROLLER ROD	4117	1

NAME	REF.	REQ'D.
BOLT SQ. HD. WITH HEX. NUT ¾" x 3½" (SW. LUG)		4
" " " " 1¾" x 2¾" (DW. MACH.)		2
" " " " ¾" x 3¼" "		2
BOLT SQ. HD. AND NUT ¾" x 2½" (P.L. & PL.)		4
" " " " ¾" x 9½" (CRANK STAND)		10
" " " " ⅞" x 3¾" (STRAP NUT)		4
SPIKE (DERAIL)		4
WASHER ⅞" COML. LOCK (RAIL BRACE BOLT)		4
" ¾" " " (SW. LUG BOLT)		4
" C.I. (CRANK STAND)	14581	10
PIN (1¼" JAW CONNECTION)	10105	16
COTTER 3/16" x 1½" (JAW PIN)		16
" 3/16" x 1¼" (¾" SW. LUG BOLT)		4
LAG SCREW ¾" x 8" (RAIL BRACE)		2
" " ¾" x 6" (TIE & P.L. PL, TIE STRAP		
CCT. CONT, CRANK STAND, DERAIL)		45
" " ¾" x 4" (TRANS. P.C.)		2
" " ½" x 3" (STRAP P.C.)		70
RIVET RD. HD. ¾" x 3¼" (BUTT STRAP)		4
" CSK. HD. ¾" x 1¾" (RISER PL.)		6
DWARF MACHINE	Y-14	1
FOUNDATION	Y-14	1
TIMBERS 7" x 9" x 10'-6" B.M. 55.125		1
" 7" x 9" x 10'-0" 52.50		1
" 7" x 9" x 16'-0" 84.00		1
" 7" x 9" x 17'-0" 89.25		1
" 7" x 10" x 15'-0" 87.50		1
TOTAL F.B.M. 368.375		
DEFLECTING RAIL	U-108	1

U-76
REV. 9
3-7-29
SHEET 2 OF 2

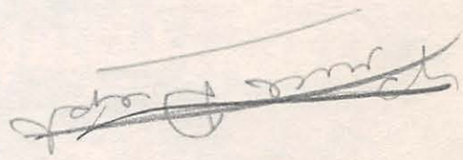
NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7634 WILL SUPERSEDE THIS PLAN.

N. Y. C. R. R.
SIGNAL DEPARTMENT

HAYES DERAIL CONNECTIONS OUTLYING SWITCH & 2 DERAILS

ALBANY, DEC. 15 - 1909.

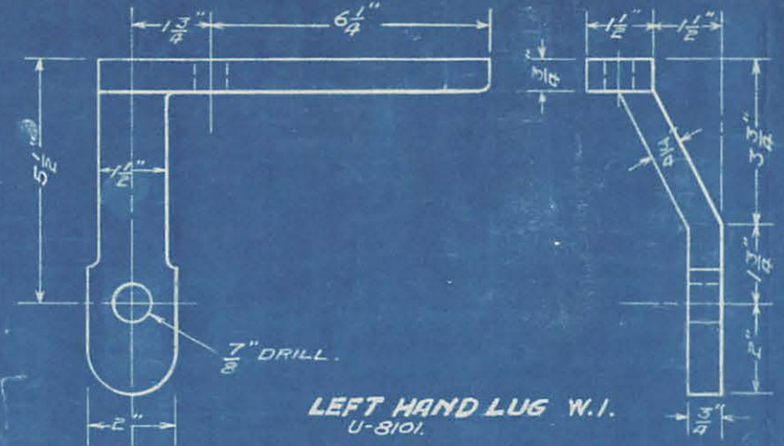
W. H. Elliott 12/7/25.
SIGNAL ENGINEER



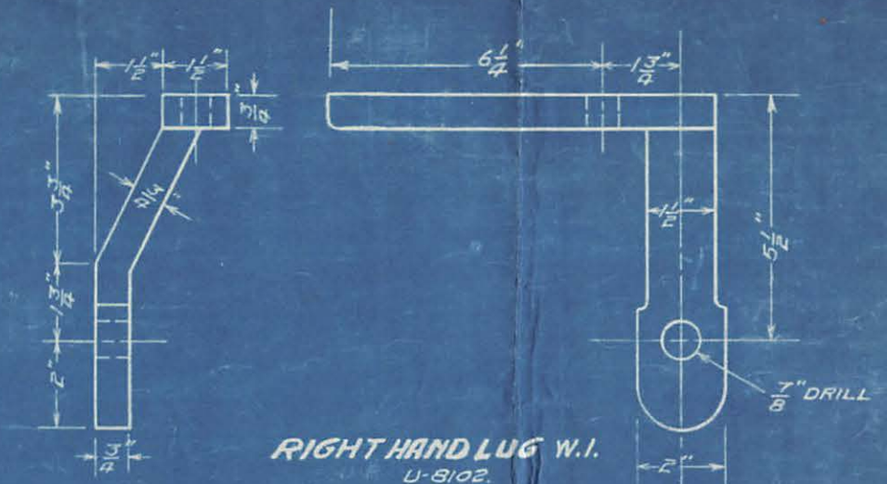
DEPT. OF STATE
MAY
11
1929

U-81
REV. 1

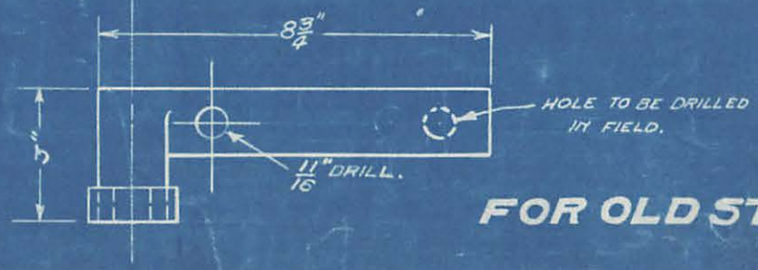
5-29-17

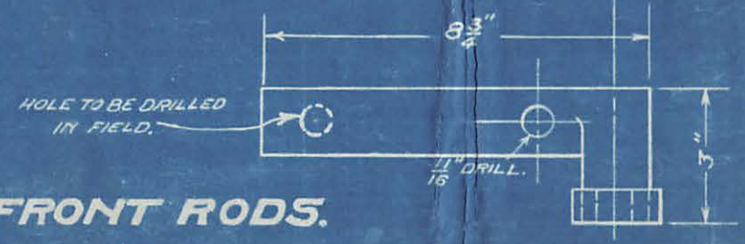


LEFT HAND LUG W.I.
U-8101.

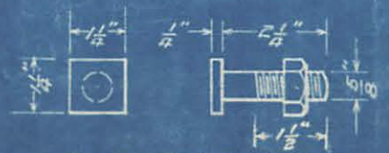


RIGHT HAND LUG W.I.
U-8102.

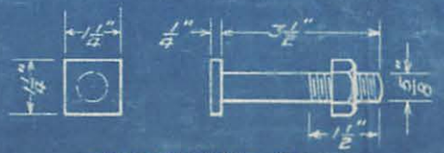




FOR OLD STYLE FRONT RODS.



SWITCH LUG BOLT
FOR POINTS NOT REINFORCED.
U-8103.



SWITCH LUG BOLT
FOR POINTS REINFORCED.
U-8104.

N. Y. C. R. R.
SIGNAL DEPT.

SINGLE SWITCH LUGS.

WITHOUT CIRCUIT CONTROLLER CONNECTION.

SCALE: 3" = 1 FT.

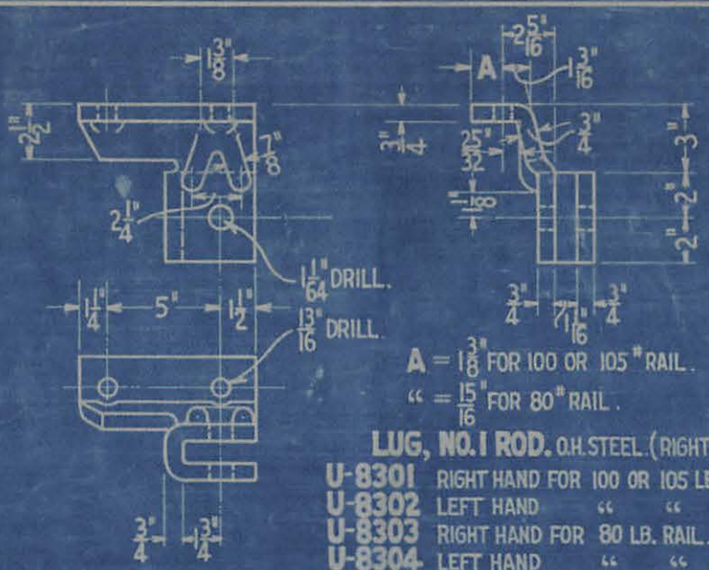
ALBANY, APR. 1 – 1912.

W. H. Elliott. 4/4/12.
SIGNAL ENGR.

RECEIVED
JUN 6 1917
WAR DEPT.

RECD
JUN 6
1917
THE U. S. A. R. AGT.

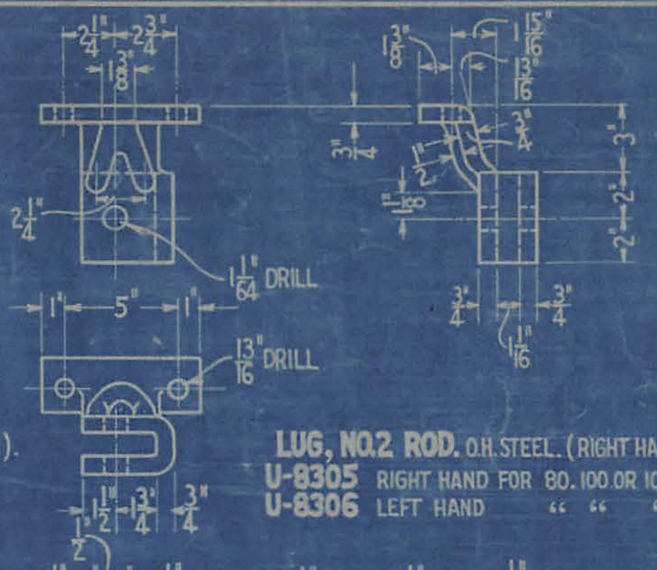
U-83
REV.
12



A = 1 3/8" FOR 100 OR 105 " RAIL.
" = 15/16" FOR 80" RAIL.

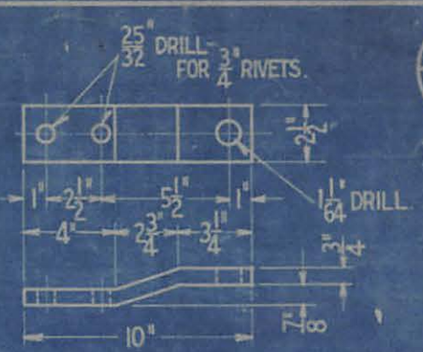
LUG, NO.1 ROD. O.H. STEEL. (RIGHT HAND SHOWN).

U-8301 RIGHT HAND FOR 100 OR 105 LB. RAIL.
U-8302 LEFT HAND " " "
U-8303 RIGHT HAND FOR 80 LB. RAIL.
U-8304 LEFT HAND " "

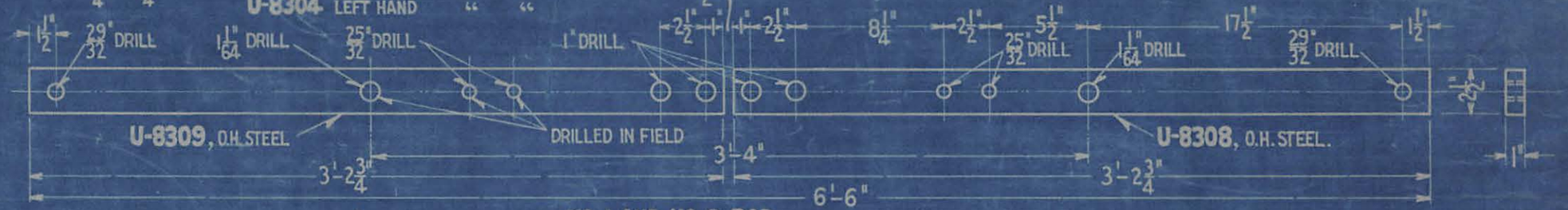


LUG, NO.2 ROD. O.H. STEEL. (RIGHT HAND SHOWN).

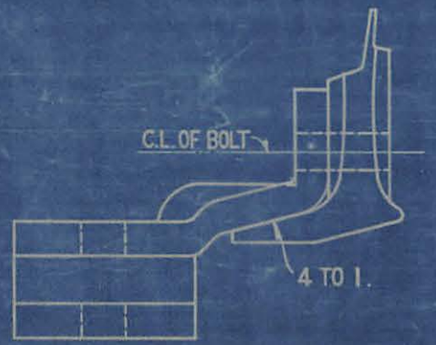
U-8305 RIGHT HAND FOR 80. 100 OR 105 LB. RAIL.
U-8306 LEFT HAND " " " "



U-8307 REINFORCING STRAP. O.H. STEEL WITH TWO 3/4" x 3" R.H. RIVETS.



NO. 1 AND NO. 2 ROD.



LUGS FOR NO. 1 AND NO. 2 RODS SHALL FIT RAIL AS SHOWN.

U-8310 BOLT, A = 3 1/2" FOR SWITCH POINTS WITHOUT SW. BOX CONNECTION.
U-8311 " "=4" " " " WITH " "

U-8312 BOLT B = 4 1/4" WHERE U-8307 IS NOT USED.
U-8313 " "= 5" " " IS USED.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

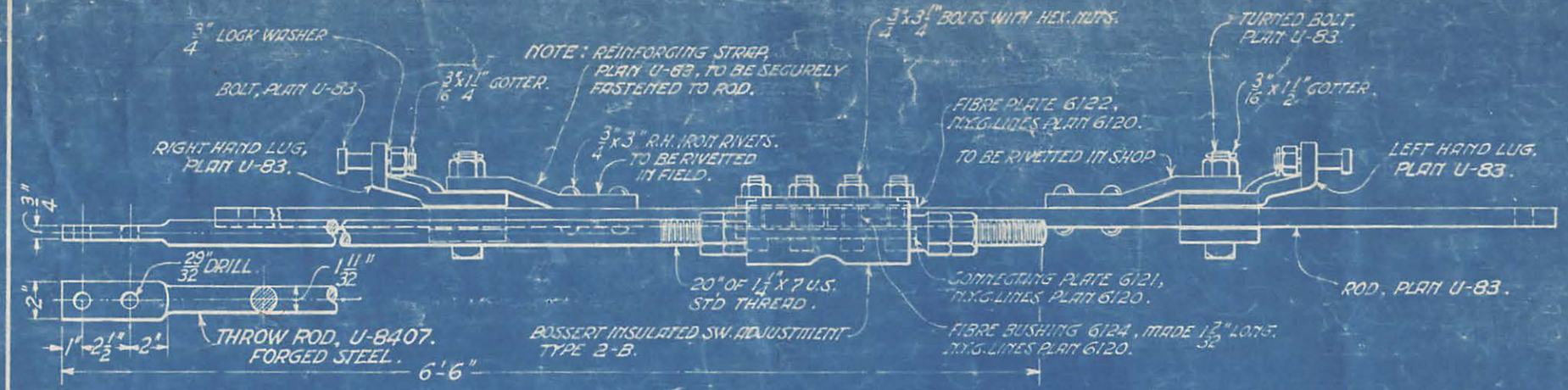
SWITCH ROD AND LUGS DETAILS

SCALE: 1 1/2" = 1'-0". ALBANY, JULY 31-1914.

W. H. Elliott '44/21
SIGNAL ENGINEER.

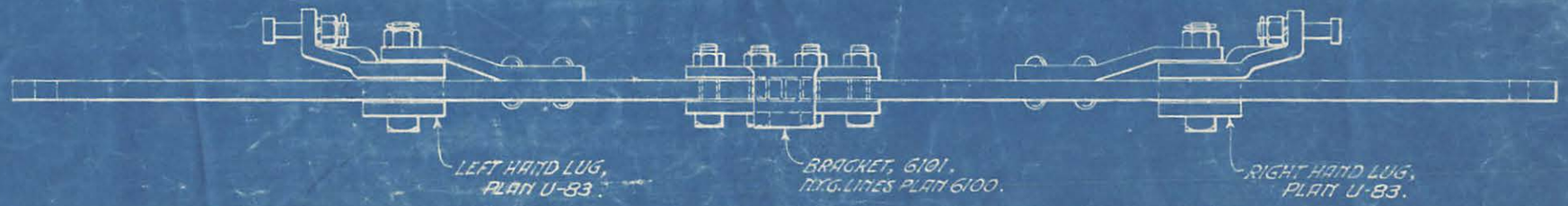
U-84
REV. 8

2-17-19


3/4" LOCK WASHER
BOLT, PLAN U-83
3/16 x 1 1/4" GOTTER.
NOTE: REINFORCING STRAP, PLAN U-83, TO BE SECURELY FASTENED TO ROD.
3/4 x 3" R.H. IRON RIVETS. TO BE RIVETTED IN FIELD.
3/4 x 3 1/4" BOLTS WITH HEX. NUTS.
TURNED BOLT, PLAN U-83.
3/16 x 1 1/2" GOTTER.
FIBRE PLATE 6122, N.Y.G. LINES PLAN 6120.
TO BE RIVETTED IN SHOP
RIGHT HAND LUG, PLAN U-83.
LEFT HAND LUG, PLAN U-83.
3/4"
29/32" DRILL.
11/32"
2"
1" 2 1/2" 2"
THROW ROD, U-8407. FORGED STEEL.
20" OF 1 1/4" X 7 U.S. STD THREAD.
BOSSERT INSULATED SW. ADJUSTMENT TYPE 2-B.
CONNECTING PLATE 6121, N.Y.G. LINES PLAN 6120.
FIBRE BUSHING 6124, MADE 1 7/32" LONG. N.Y.G. LINES PLAN 6120.
ROD, PLAN U-83.
6'-6"

No 2 ROD COMPLETE, U-8402.

NOTE: FOR REFERENCE NUMBERS OF PARTS ON NO. 1 ROD WHICH ARE NOT DESIGNATED REFER TO SAME PARTS ON NO. 2 ROD.



No. 1 ROD COMPLETE, U-8401.

No. 1 ROD WITHOUT LUGS OR LUG BOLTS, U-8403.
No. 2 " " " " " " " U-8404.
BOSSERT INSULATED SWITCH ADJUSTMENT WITH THROW ROD, U-8405.
" " " " " ADJUSTMENT NUTS ONLY, U-8406.
THROW ROD, U-8407.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

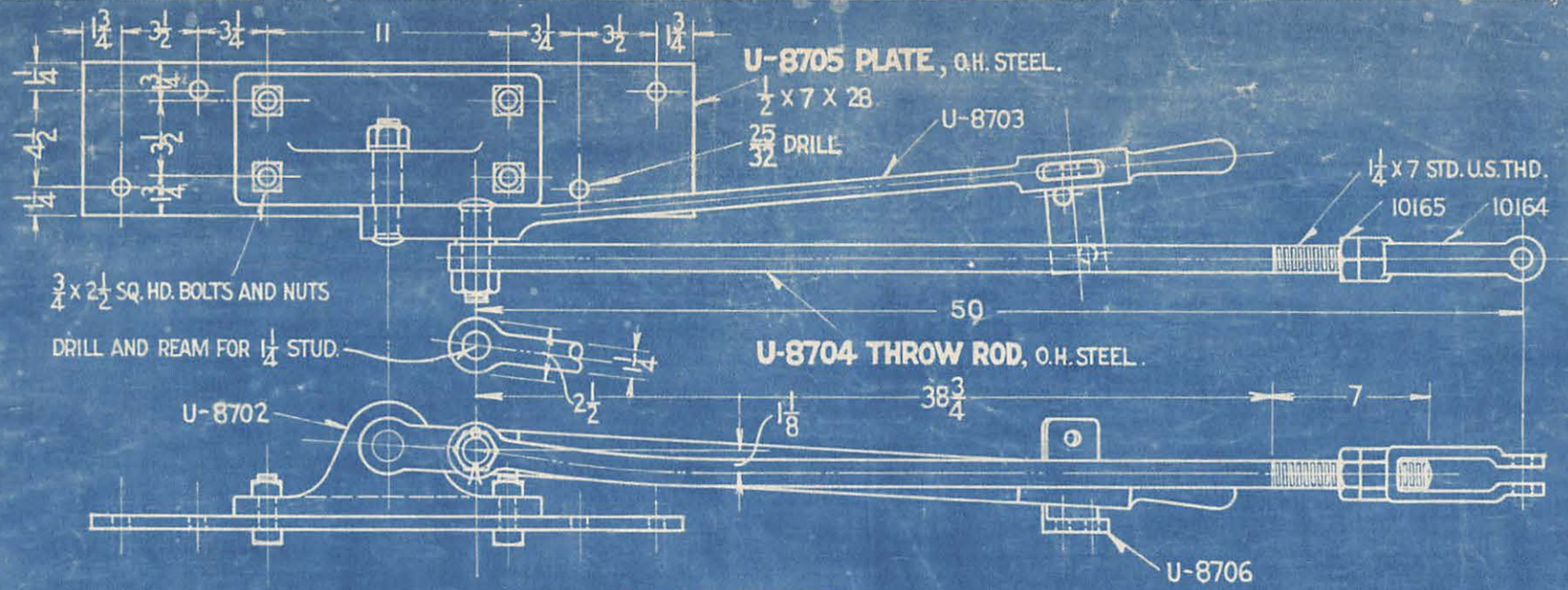
SWITCH ROD AND LUGS FOR 1" X 2 1/2" ROD.

SCALE: 1 1/2" = 1'-0" ALBANY, JULY 31st 1914.

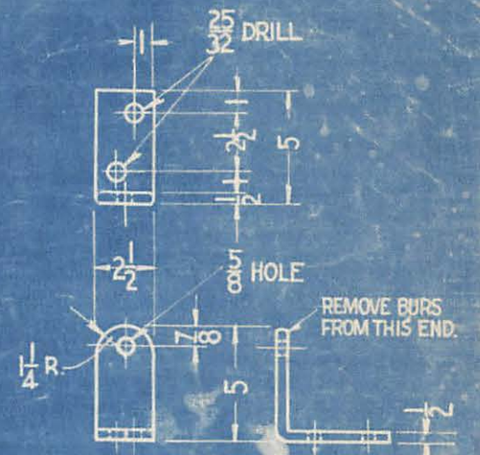
W.H. Elliott 7/21/14.

SIGNAL ENGINEER.

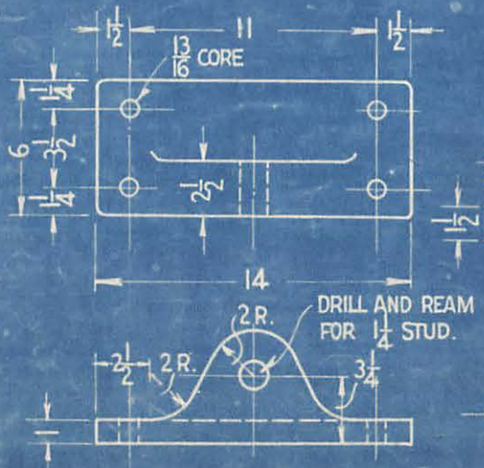
U-87
REV. 3
1-19-31



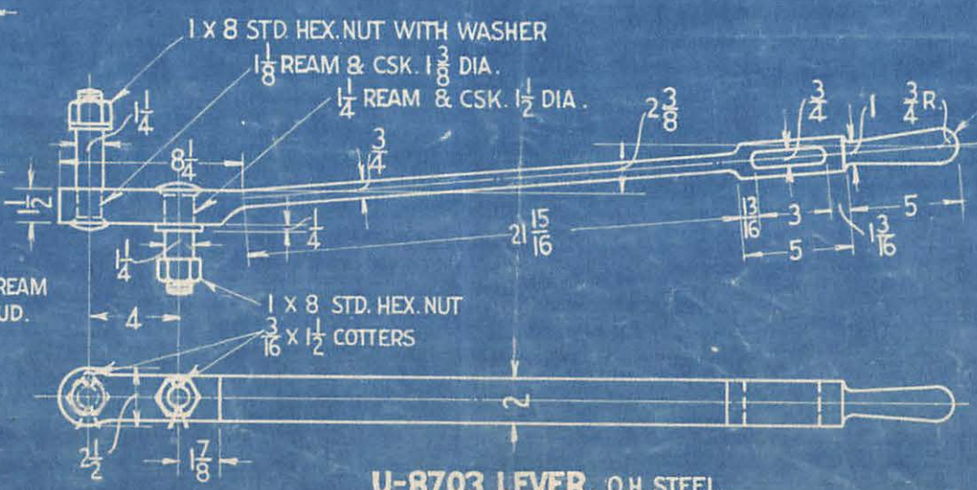
U-8701 ASSEMBLY.



U-8706 BRACKET, O.H. STEEL.



U-8702 STAND, C.I.

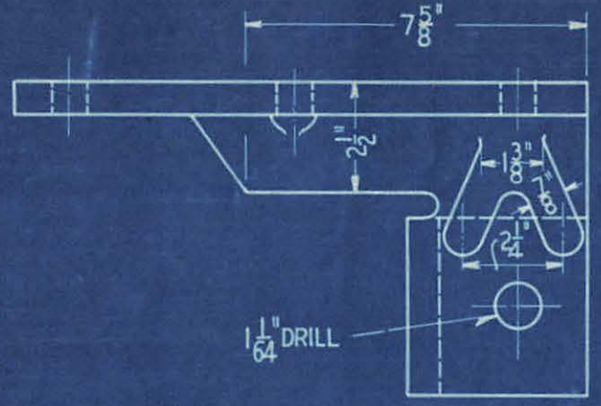


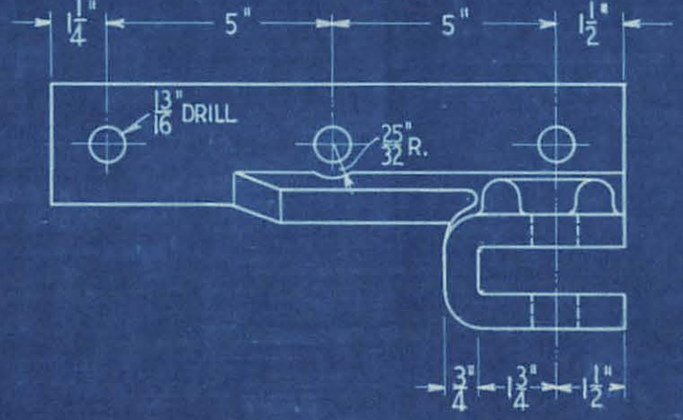
U-8703 LEVER, O.H. STEEL.

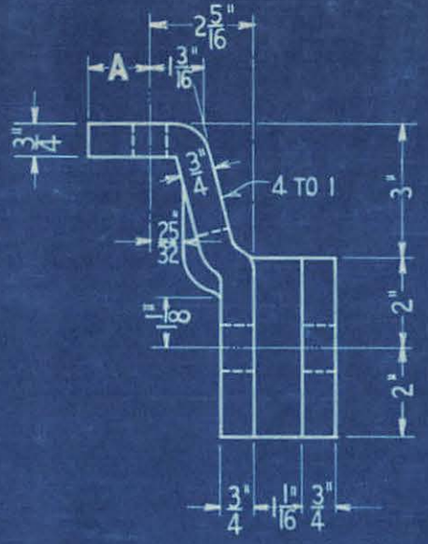
0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES.

N.Y.G.R.R.
SIGNAL DEPARTMENT
THROW-OVER LEVER
ALBANY, FEB. 24 1913.
W.H. Elliott. 11/16/31
SIGNAL ENGINEER.

U-88
REV.



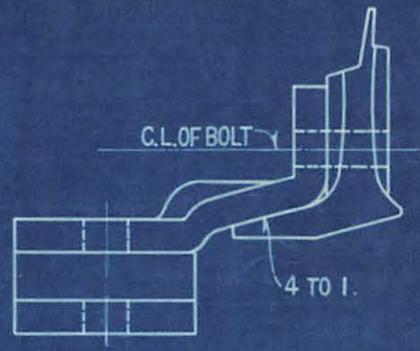




A = 1 3/8" FOR 100 OR 105 LB. RAIL.
" = 15/16" FOR 80 LB. RAIL.

LUG NO. 1 ROD. O.H. STEEL.
(RIGHT HAND SHOWN).

U-8801	RIGHT HAND FOR 100 OR 105 LB. RAIL
U-8802	LEFT HAND " " "
U-8803	RIGHT HAND FOR 80 LB. RAIL
U-8804	LEFT HAND " "



LUGS SHALL FIT RAIL AS SHOWN.

N. Y. C. R. R.
SIGNAL DEPARTMENT.

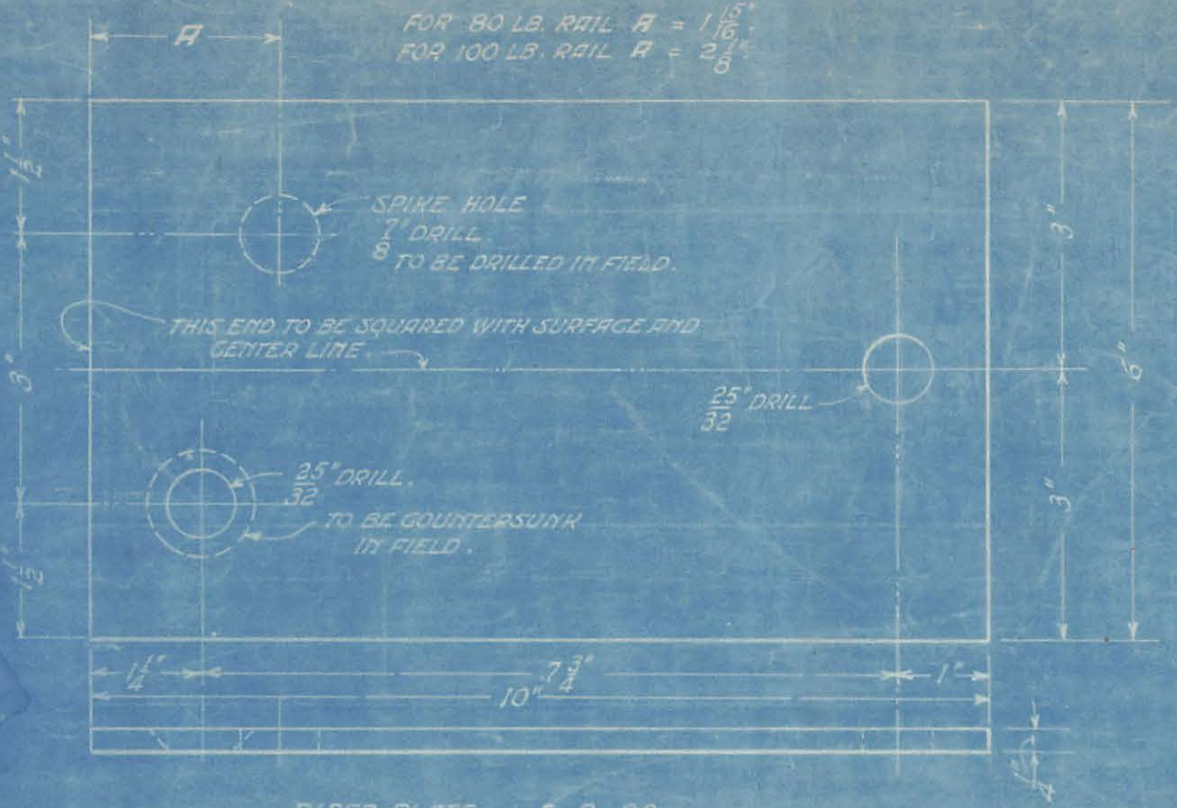
SWITCH LUG
NON INTERLOCKED SWITCH

SCALE: 3" = 1'-0". ALBANY. NOV. 2ND - 1914.

W. H. Elliott 6/15/21.
SIGNAL ENGINEER.

U-91
REV. 4

7-14



RISER PLATE. S. O. 88.

NOTE:- RISER PLATE SHALL BE SMOOTH AND FREE FROM RUST ON ALL SURFACES.

RISER PLATES SHALL BE OF OPEN HEARTH STEEL AND MAY BE PROCURED FROM THE LACKAWANNA STEEL COMPANY.
RISER PLATES SHALL BE MADE OF THE FOLLOWING COMPOSITION:

CARBON	.35 TO .40
MANGANESE	.40 TO .60
SULPHUR NOT TO EXCEED	.04
PHOSPHORUS NOT TO EXCEED	.04

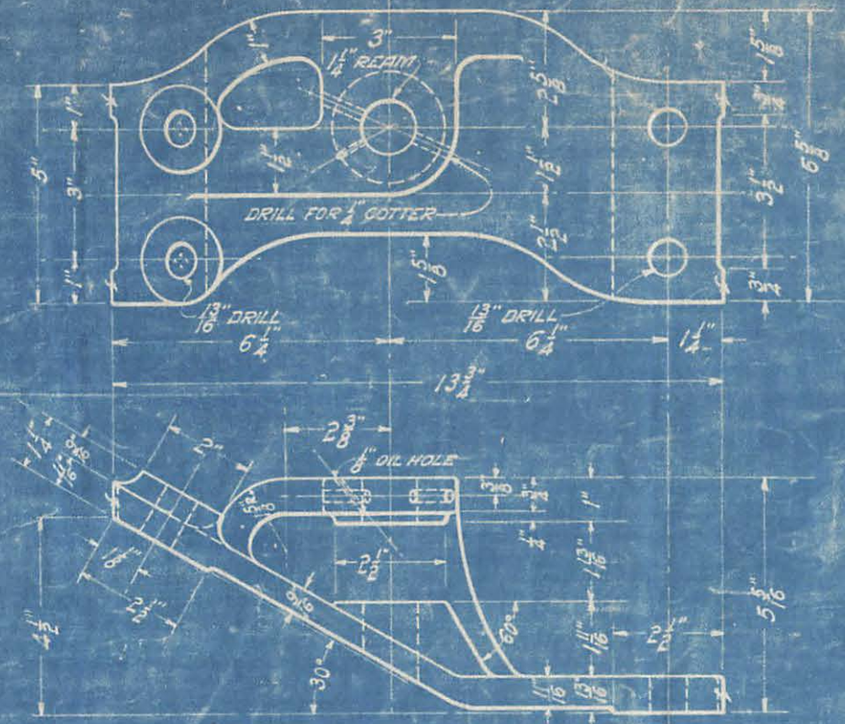
N.Y.C.R.R.
SIGNAL DEPARTMENT.

RISER PLATE.

SCALE 6" = 1'-0" ALBANY. SEPT. 30, 1913.

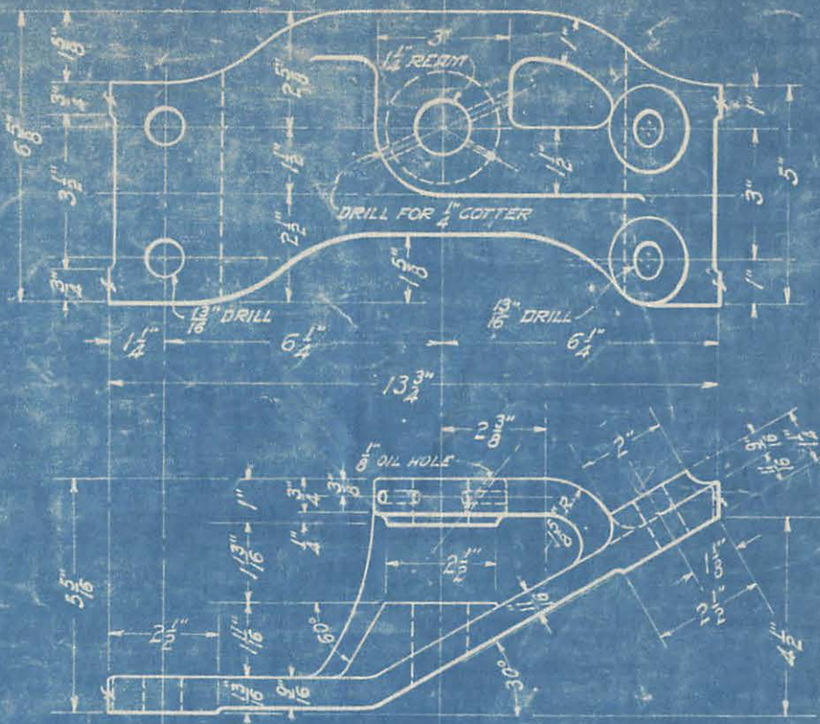
W. H. Elliott
SIGNAL ENGR.

U-93
REV. 3
11-6-17



U-9301 - LEFT HAND BASE ONLY, CAST IRON.
U-9302 - " " " COMP. WITH PIN & COTTER.
U-9303 - " " " " " CRANK, PIN & COTTER.

U-9307 - CRANK ONLY, WROT. IRON.



U-9304 - RIGHT HAND BASE ONLY, CAST IRON.
U-9305 - " " " COMP. WITH PIN & COTTER.
U-9306 - " " " " " CRANK, PIN & COTTER.

U-9308 - PIN
C.R. STEEL.

N.Y.C.R.R.

SIGNAL DEP'T.

GAIN STROKE CRANK

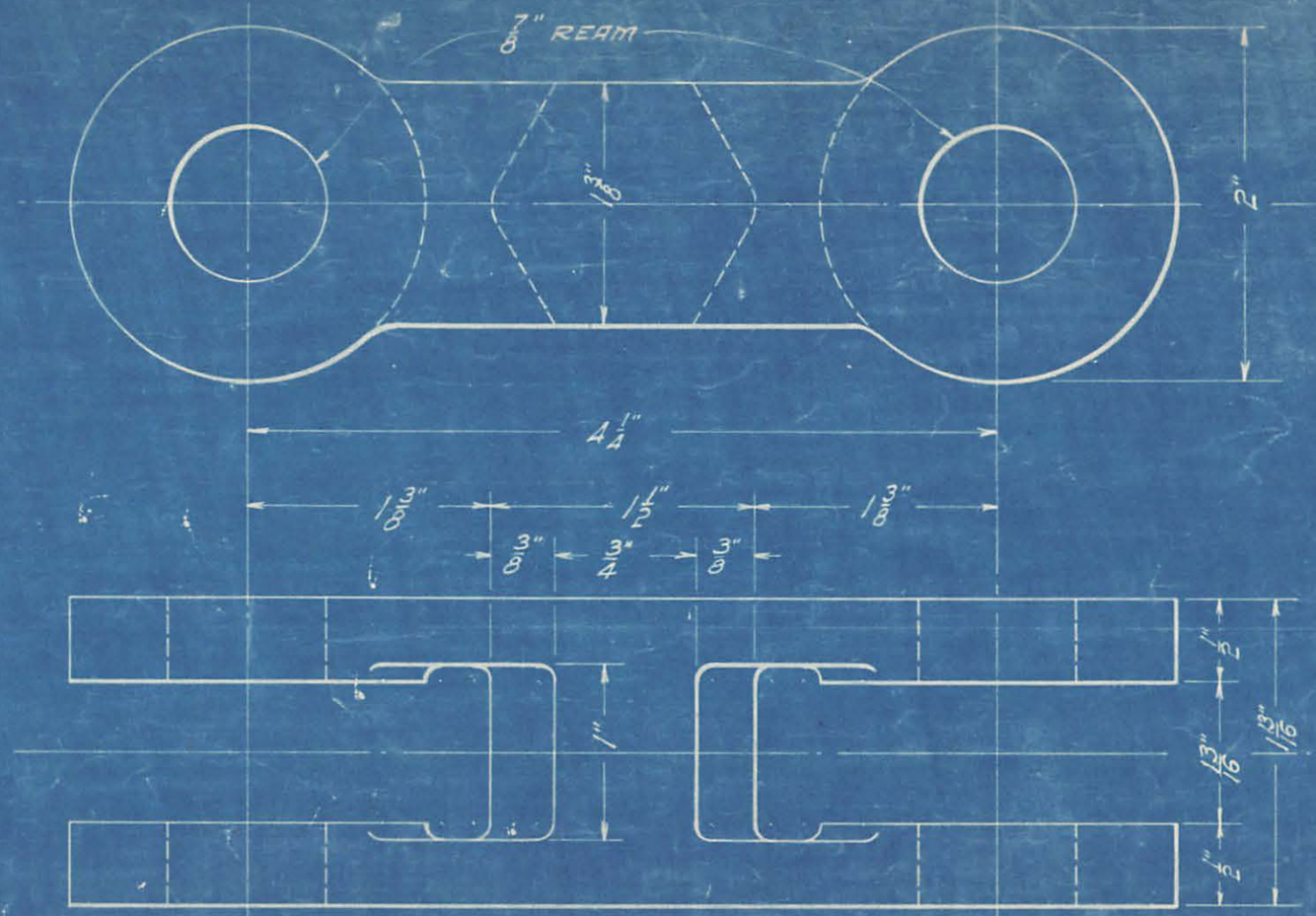
POWER SWITCH MACHINE.

SCALE 3" = 1'-0" ALBANY DEC. 31, 1913.

W.H. Elliott 1/31/14
SIGNAL ENG'R.

THE U. S. & S. CO.
MAILING DEPT.

U-94



S.D. 849 CONNECTING LINK, MALL. IRON.

N.Y.C. & H.R.R.R.

SIGNAL DEP'T.

CONNECTING LINK

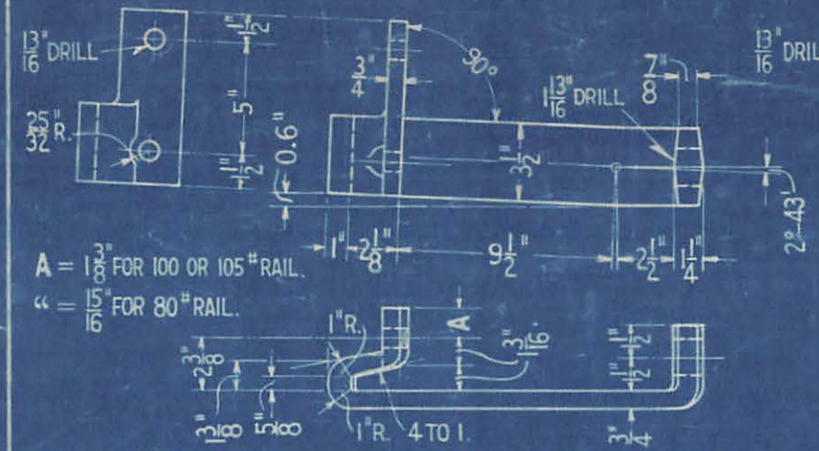
GAIN STROKE CRANK.

FULL SIZE ALBANY JAN. 2, 1914

W. H. Elliott. 1/31/14

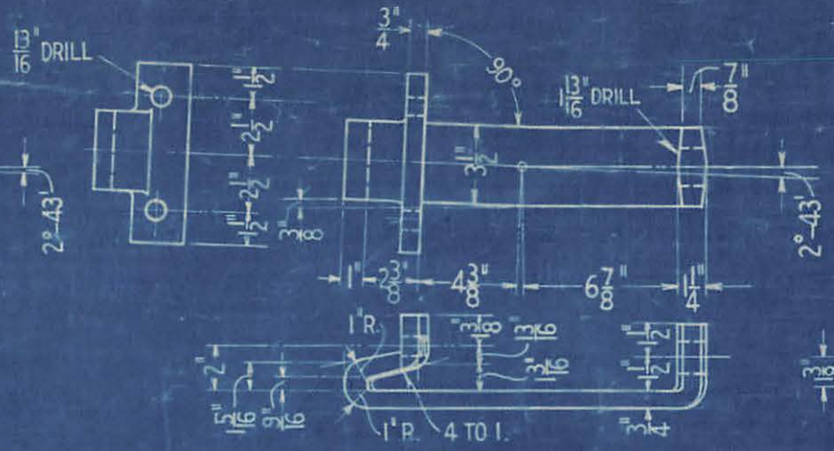
SIGNAL ENG'R.

U-96
REV.



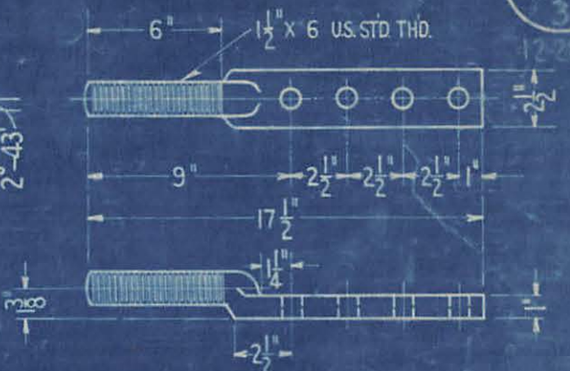
ADJUSTMENT LUG, FRONT BAR O.H. STEEL (RIGHT HAND SHOWN).

U-9601 RIGHT HAND FOR 100 OR 105 LB. RAIL.
U-9602 LEFT HAND " " "
U-9603 RIGHT HAND FOR 80 LB. RAIL.
U-9604 LEFT HAND " "



ADJUSTMENT LUG, NO. 1 BAR O.H. STEEL. (RIGHT HAND SHOWN).

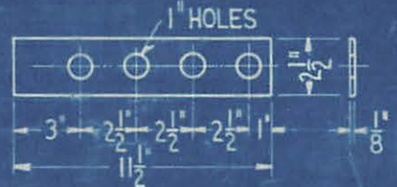
U-9605 RIGHT HAND FOR 80, 100 OR 105 LB. RAIL.
U-9606 LEFT HAND " " " "



ADJUSTMENT STRAP. O.H. STEEL.

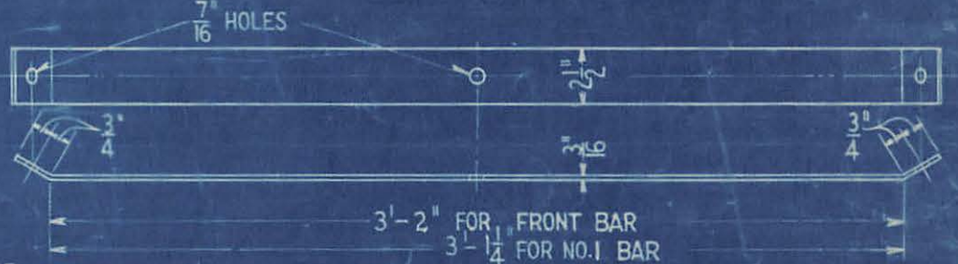
U-9607 WITH 25/32" HOLES.
U-9608 WITH 1" HOLES.

U-9609 NUT.

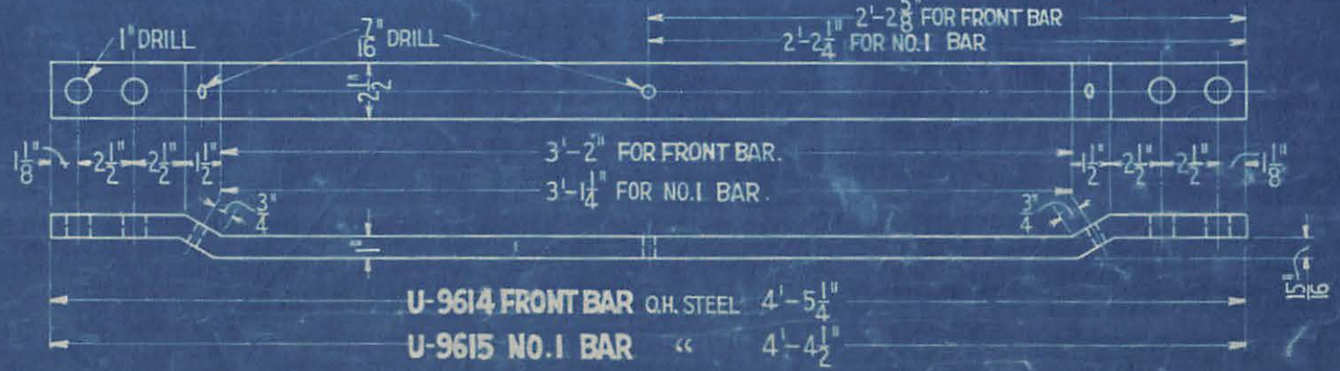


U-9610 FIBRE PLATE.

U-9611 FIBRE BUSHING.



U-9612 FIBRE PLATE, FRONT BAR
U-9613 " " NO. 1 "



U-9614 FRONT BAR O.H. STEEL 4'-5 1/4"
U-9615 NO.1 BAR " 4'-4 1/2"

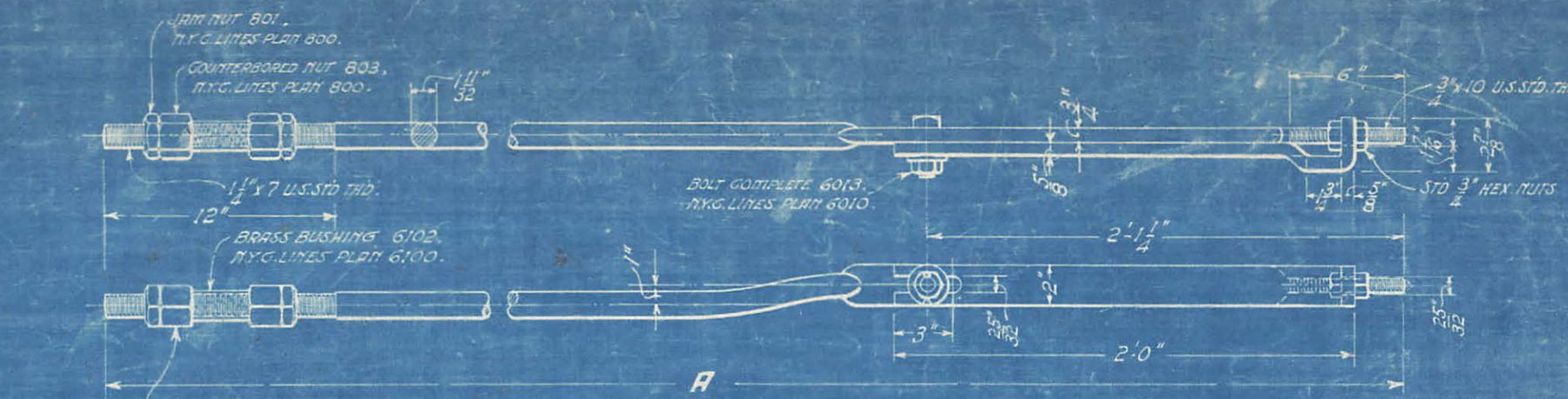
N. Y. C. R. R.
SIGNAL DEPARTMENT.

BARS AND LUGS FOR DOUBLE SLIP.

SCALE: 1 1/2" = 1'-0" ALBANY, APRIL 26, 1915.

W. H. Elliott. 7/10/21
SIGNAL ENGINEER.

U-97
REV.



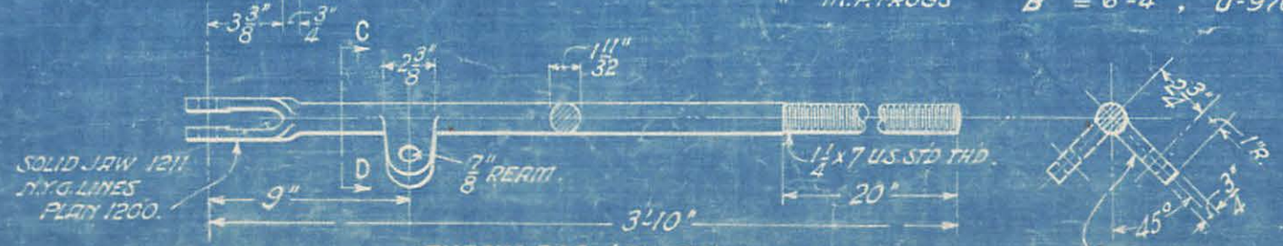
NOTE: SCREW JAW 1208 AND NUT 801 N.Y.C. LINES PLAN 1200 SHALL BE FURNISHED WITH U-9702 IN PLACE OF NUTS AND BUSHING.

LOCK ROD, FORGED STEEL.

FOR SINGLE SWITCH	A = 6'8",	U-9701
" DOUBLE SLIP	A = 5'0",	U-9702
" " "	A = 6'2",	U-9703
" M.P. FROGS	A = 7'8",	U-9704

THROW ROD, FORGED STEEL.

FOR SINGLE SWITCH	B = 4'-10",	U-9705
" DOUBLE SLIP	B = " ,	"
" " "	B = 7'6",	U-9706
" M.P. FROGS	B = 6'-4",	U-9707.



THROW ROD (SHORT), FORGED STEEL.
WITH R.H. LUG, U-9708.
WITH L.H. LUG, U-9709.

R.H. LUG.
SECTION C-D.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

LOCK AND THROW RODS.

LOW PRESSURE PNEUMATIC MOVEMENT.

SCALE: 1 1/2" = 1'-0". ALBANY, MARCH 7th 1916.

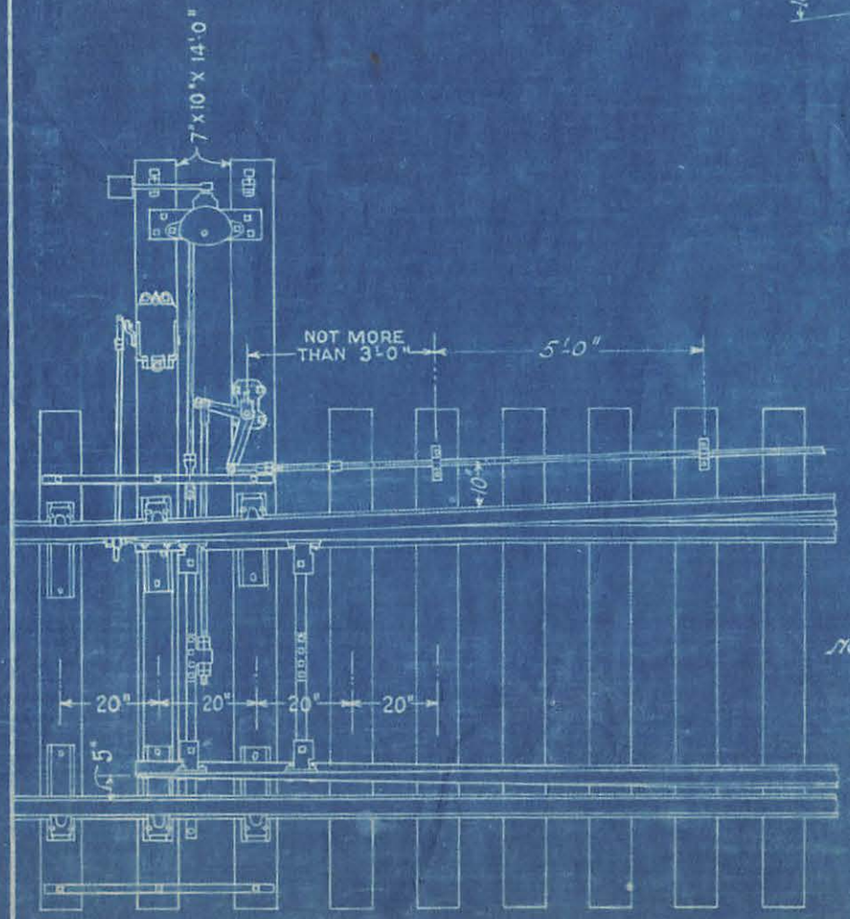
W. H. Elliott 3/11/16

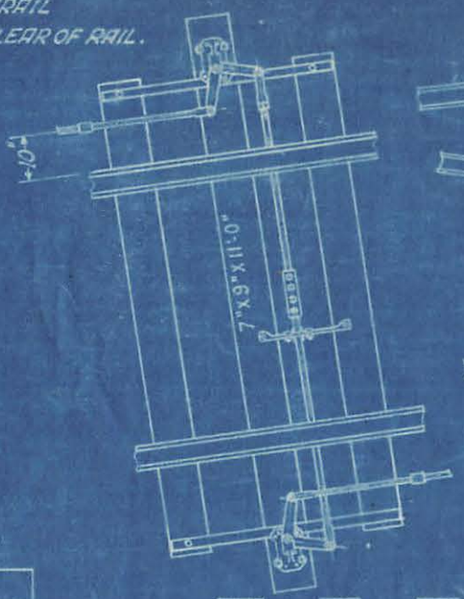
SIGNAL ENGINEER.

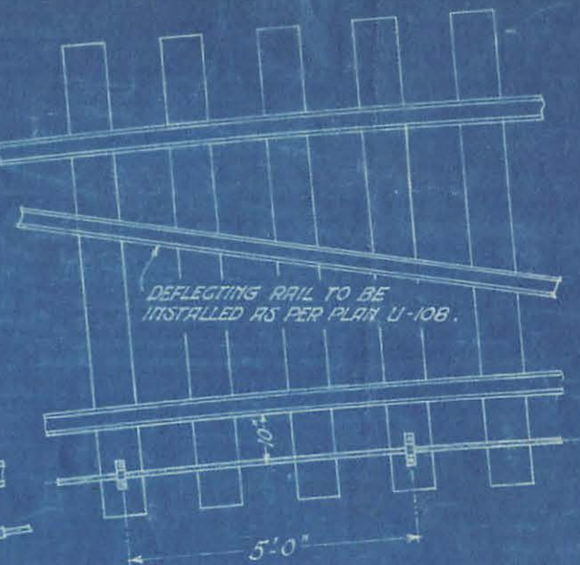
U-98
2-21-17
SHEET-1

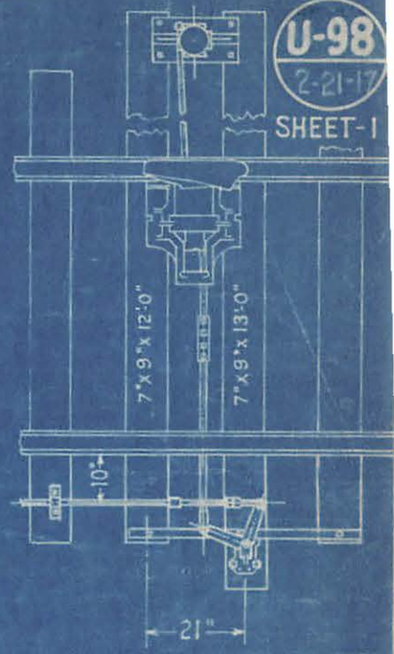
DAY INDICATION OF TARGET
RED - WHEN SET TO DERAIL
YELLOW- " DERAIL IS CLEAR OF RAIL.

NIGHT INDICATION
PURPLE - WHEN SET TO DERAIL
YELLOW- " DERAIL IS CLEAR OF RAIL.









NOTES: STANDARD M. OF W. DEPT. TIE PLATES AND RAIL BRACES SHALL BE USED FOR ALL TIES.

MOVABLE PARTS OF DERAIL SHALL BE PAINTED RED.

HAYES DERAILS SHALL NOT BE INSTALLED ON INSIDE OF CURVES GREATER THAN 1°.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

HAYES DERAIL CONNECTIONS, FOR TRAILING TURNOUT.

SCALE: 5/16"=1'-0". ALBANY, FEB. 21st 1917.

W. H. Elliott 2/22/17

RECD MAR 6 1917 THE C. G. S. BUREAU OF ENGRAVING

RECEIVED MAR 1917 EST. DEPT.

U-98
2-21-17
SHEET-2

DESCRIPTION	REFERENCE NO.	PLAN NO.	REQUIRED	REMARKS
BRACKET	6101	6100	1	
TIE STRAPS	5925	5920	5	
CRANK STANDS	1513	1510	4	
CRANKS 9" x 9"	904	900	3	
" 11 3/4 x 11 3/4"	903	"	1	
TRANSVERSE PIPE CARRIER	301	300	1	
STRAP PIPE CARRIERS	2302	2300	45	APPROX.
SIGNAL PIPE, PLUGS & COUPLINGS		500	225 FT.	APPROX.
STRAIGHT TANG END SCREW JAWS	1206	1200	2	
" " " SOLID "	1001	1000	2	
HAYES DERAIL	MODEL "C" SIZE 6.		1	R.H. OR L.H. AS REQUIRED.
DERAIL TARGET	SD. 752	T-122	1	
DERAIL LAMP		2200	1	PURPLE & YELLOW LENSES.
DERAIL CONNECTING ROD	SD. 665	U-72	1	
DERAIL TARGET CONNECTING ROD	SD. 666	"	1	
CROSS " "	SD. 664	"	1	
THROW ROD.	SD. 1109	"	1	
SWITCH CIRCUIT CONTROLLER	HALL-3 POS. STYLE "H"		1	WHERE REQ'D.— CRANK TO BE
				DRILLED TO FIT RSA BALL STUD.
POINT LUG	S.D. 1123	X-98	1	WHERE REQ'D.
INSULATING CONNECTION	S.D. 1120	"	1	WHERE REQ'D.
BOLTS	SD. 833	U-83	2	" " FOR POINT LUG.
" SQ. NUTS 3/4" x 9 1/2"			8	CRANK STANDS.
O G WASHERS	1515	1510	8	" "
LAG SCREWS 3/4" x 4"			12	STRAPS.
" 3/4" x 7"			8	CRANK STANDS
" 1/2" x 3"			100	APPROX. - FOR P.C. AND TARGET.
" 3/4" x 4"			3	WHERE REQ'D. - FOR CIR. CONTROLLER.
TURNED PINS. 7/8" x 2 1/4"	1805	1800	11	
COTTERS 3/16" x 1 1/2"			11	

DESCRIPTION	REFERENCE NO.	PLAN NO.	REQUIRED	REMARKS

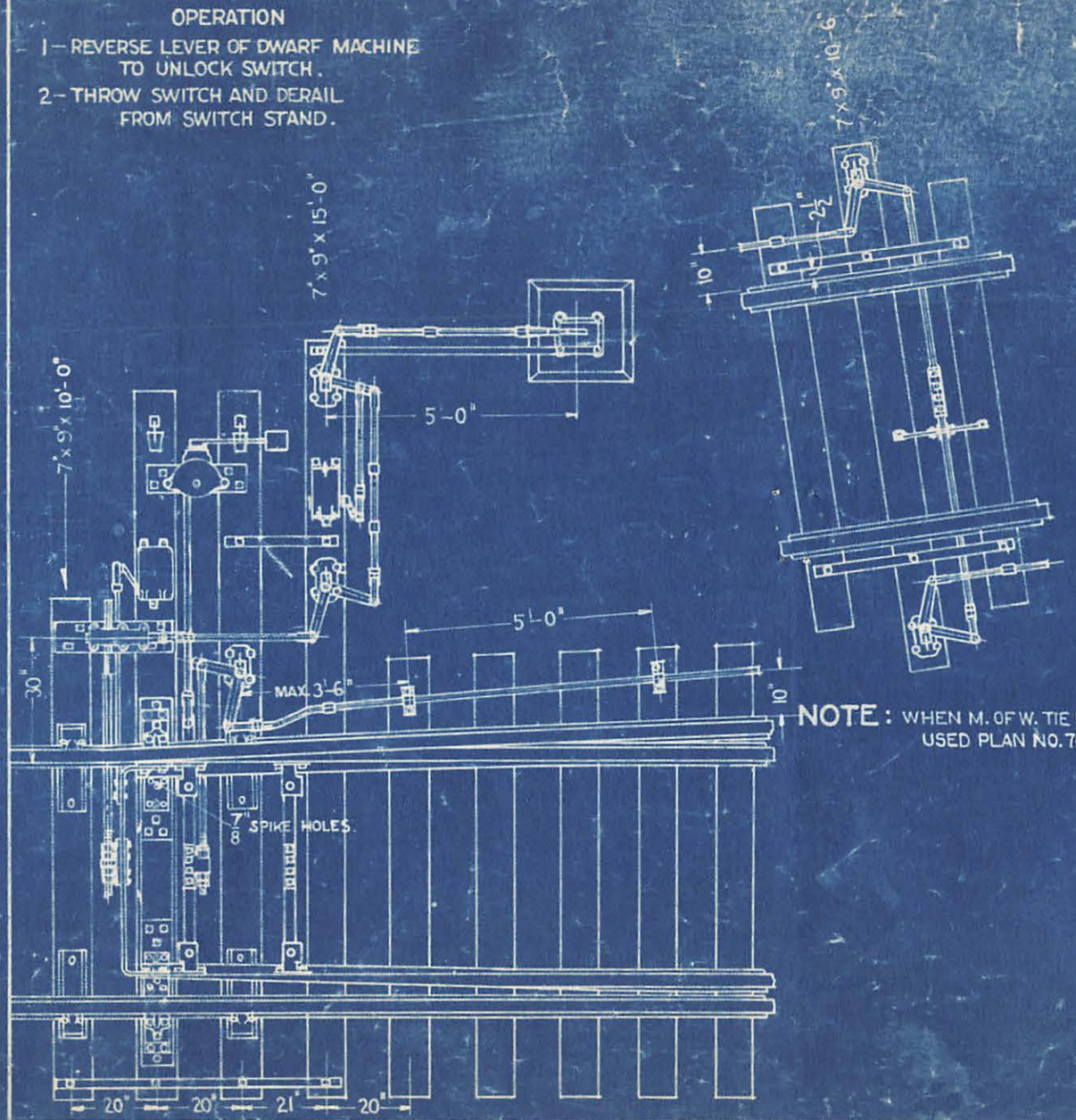
RECD MAR 9 1917 THE C. P. R. CO.

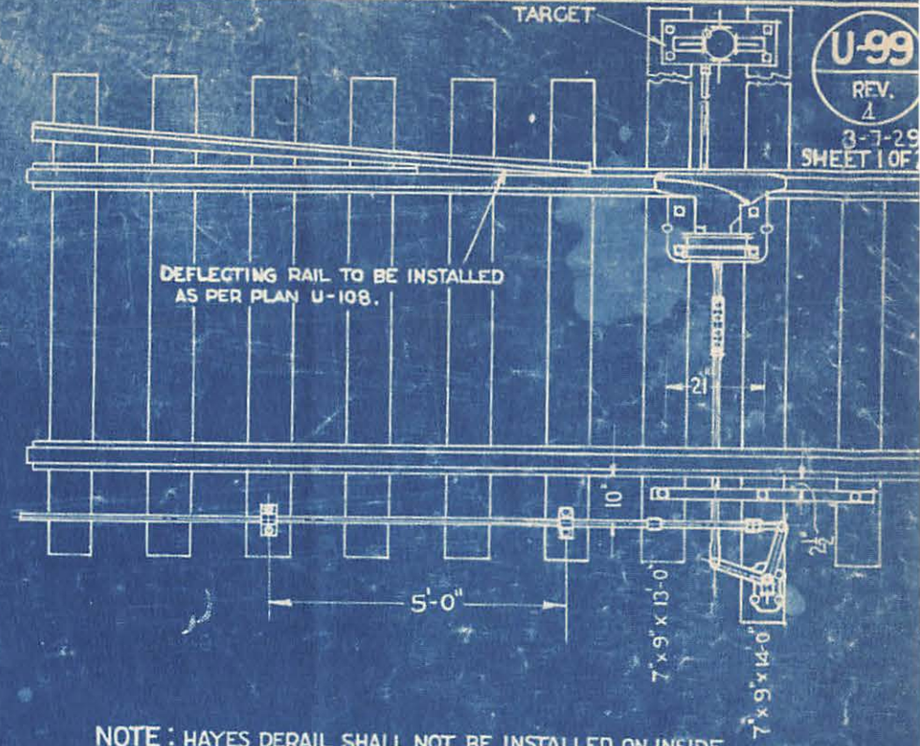
RECEIVED MAR 9 1917 EST. DEPT.

OPERATION

1 – REVERSE LEVER OF DWARF MACHINE TO UNLOCK SWITCH.

2 – THROW SWITCH AND DERAIL FROM SWITCH STAND.





U-99
REV. 4
3-7-29
SHEET 1 OF

NOTE: HAYES DERAIL SHALL NOT BE INSTALLED ON INSIDE OF CURVES OF LESS RADIUS THAN 1°.

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7636 WILL SUPERSEDE THIS PLAN.

0 1 2 3 4 5 6

SCALE OF FEET.

N. Y. C. R. R.

SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK WITH HAYES DERAIL

ALBANY, APRIL 30-1917.

W. H. Elliott, 7/19/23.

SIGNAL ENGINEER

NAME	REF.	REQ'D.
FRONT ROD	4116-A	1
BRACKET	6101	1
LOCK ROD COMPLETE WITHOUT 6102	U-7202	1
PLUNGER STAND COMPLETE	14253	1
PLUNGER LOCK CONN. ROD COMPL.	5960-2	1
TIE PLATE	5940-6	2
RISER PLATE	5940-14	2
PLUNGER LOCK PLATE	5940-8	1
BUTT STRAP	5940-17	2
STRAP NUT	5940-13	2
TIE STRAP	5940-2	3
" " 16 FT. LONG (LEVER STAND&TIES)	5940	1
CRANK STAND COMPL. WITH 11¾" x 11¾" CRANK	10116	2
" " " ONLY	1008-2	4
CRANK, R.H.	5840-8	2
" L.H.	5840-7	2
TRANSVERSE PIPE CARRIER	10721	1
STRAP " "	10714	38
PIPE, COUPLING AND PLUG WITH RIVET.	1015	225 FT.
STRAIGHT TANG END SOLID JAW	10181	4
STRAIGHT TANG END SCREW JAW (OFFSET IN FIELD)	13605	1
STRAIGHT TANG END SCREW JAW	10199	3
DERAIL, HAYES MODEL HP, SIZE 6.	R.H. OR L.H.	1
DERAIL ROD COMPL.	5840-6	1
TARGET STAND AND LAMP COMPL.	5850-10	1
TARGET ROD COMPL.	5850-9	1
CROSS ROD COMPL.	5840-5	1
THROW ROD, MADE 57 INS. LONG.	5840-1	1
BRASS BUSHING	6102	1
COUNTERBORED NUT	803	2
JAM NUT	801	2
RAIL BRACE	2920-1	2

NAME	REF.	REQ'D.
SW.CCT. CONTROLLER, HALL 2 POS. STYLE G-2		2
SW.CCT. CONTROLLER ROD,	4117	1
		1
" " " "	U-7204	1
BOLT SQ. HD. WITH HEX. NUT ¾" x 3½" (SW. LUG)		4
" " " " ¾" x 2¾" (DW. MACH.)		2
" " " " ¾" 3¼" "		2
		2
		2
BOLT SQ. HD. AND NUT ¾" x 2½" (P.L. & PL.)		4
" " " " ¾" x 9½" (CRANK STAND)		12
" " ONLY ⅞" x 3¾" (STRAP NUT)		4
SPIKE (DERAIL)		2
WASHER ⅞" COML. LOCK (RAIL BRACE BOLT)		4
" ¾" " " (SW. LUG BOLT)		4
" C.I. (CRANK STAND)	14581	12
PIN (1¼" JAW CONNECTION)	10105	16
COTTER 3/16" x 1½" (JAW PIN)		16
" 3/16" x 1¼" (¾" SW. LUG BOLT)		4
LAG SCREW ¾" x 8" (RAIL BRACE)		2
" " ¾" x 6" (TIE & P.L. PL., TIE STRAP CCT. CONT., CRANK STAND, DERAIL)		50
" " ¾" x 4" (TRANS. P.C.)		2
" " ½" x 3" (STRAP P.C.)		76
RIVET RD. HD. ¾" x 3¼" (BUTT STRAP)		4
" CSK. HD. ¾" x 1¾" (RISER PL.)		6
DWARF MACHINE	Y-14	1
FOUNDATION	Y-14	1
TIMBERS 7" x 9" x 10'-0" 52.50		1
" 7" x 9" x 10-6" 55.125		1
7" x 9" x 13'-0" 68.25		1
" 7" x 9" x 14'-0" 73.50		1
" 7 x 9 x 15'-0" 78.75		1
TOTAL F.B.M. 328.125		
DEFLECTING RAIL	U-108	1

U-99
REV. 4
3-7-29
SHEET 2 OF 2

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7636 WILL SUPERSEDE THIS PLAN.

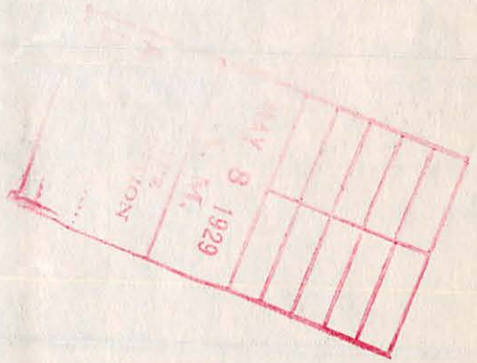
N. Y. C. R. R.
SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK WITH HAYES DERAIL

ALBANY, APRIL 30-1917.

W. H. Elliott 19/19/23
SIGNAL ENGINEER.

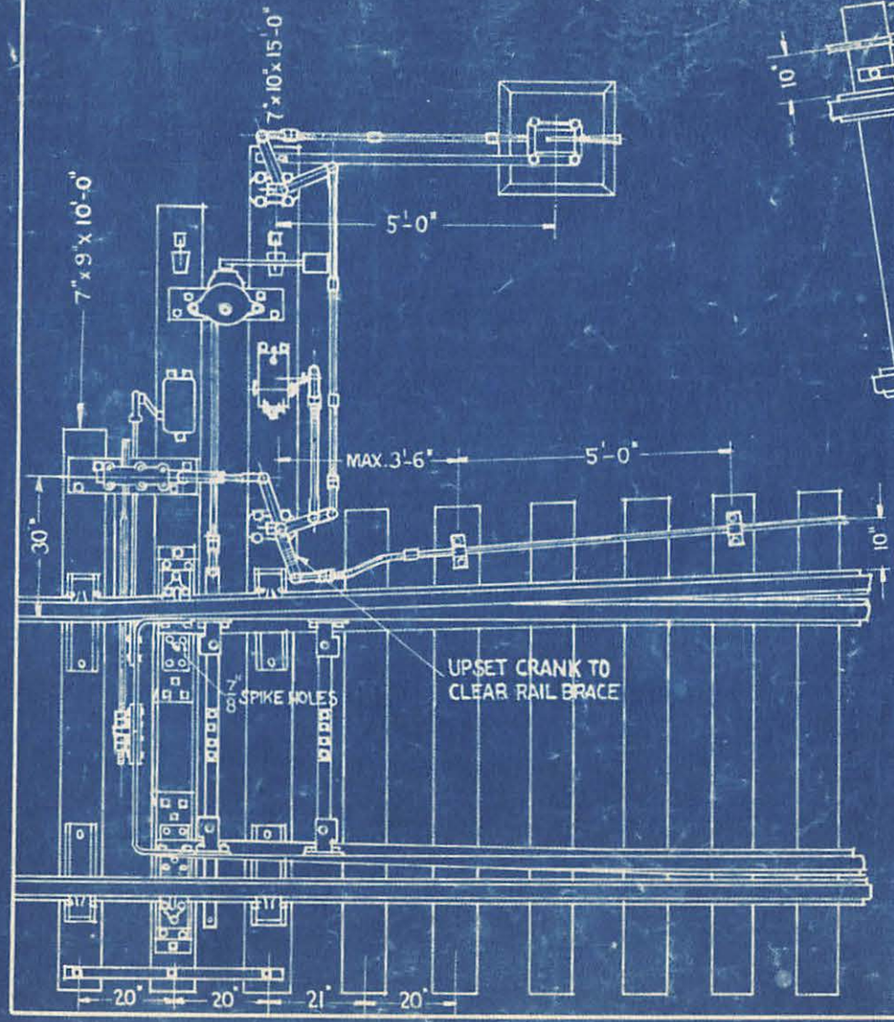
DEPT. 41
MAY
8
1929
U. S. S. CO.

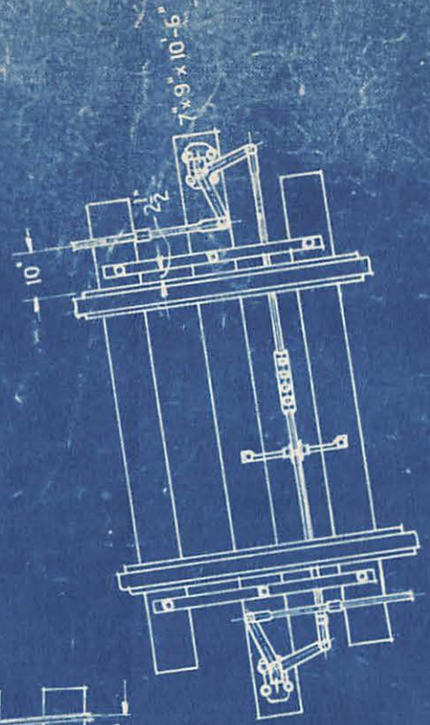

MAY 8 1929

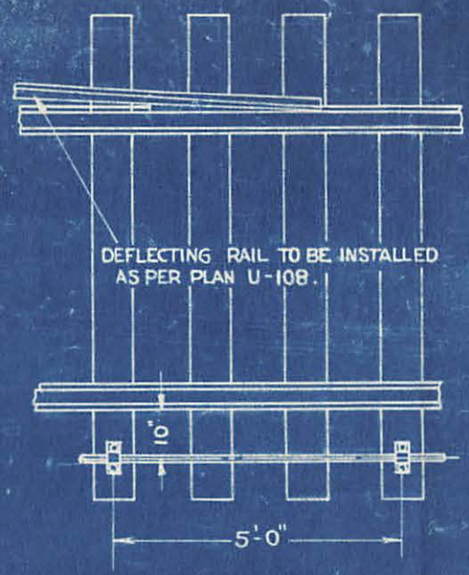
OPERATION

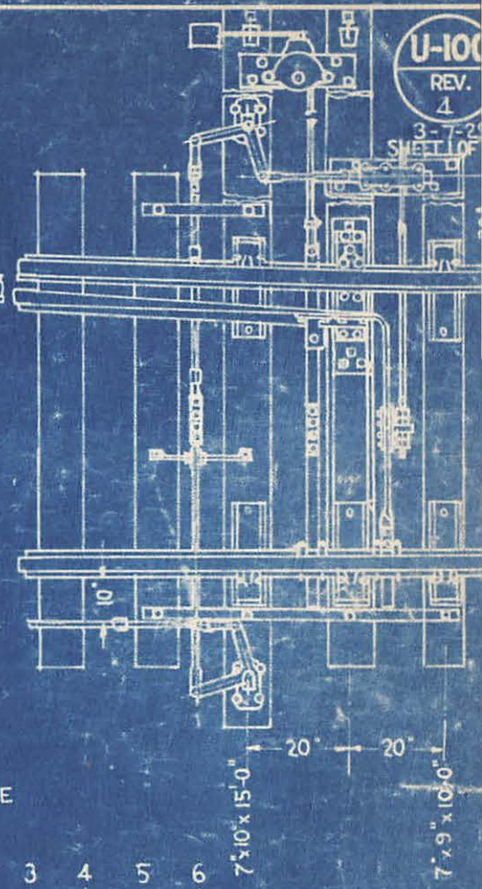
1 - REVERSE LEVER OF DWARF MACHINE TO UNLOCK SWITCH AND DERAIL.

2 - THROW SWITCH AND DERAIL FROM SWITCH STANDS.









NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7638 WILL SUPERSEDE THIS PLAN.

0 1 2 3 4 5 6

SCALE OF FEET.

U-100 REV. 4 3-7-22 SHEET 1 OF

N. Y. C. R. R.

SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK WITH SPLIT POINT DERAIL

ALBANY, MAY 1 - 1917.

W. H. Elliott. 10/5/23

SIGNAL ENGINEER.

DEPT. OF AGR.
MAY 11
1929
U. S.

NAME	REF.	REQ'D.
FRONT ROD	4116-A	1
DERAIL ROD (AS REQD.)	4116-B OR C	1
LOCK ROD COMPLETE WITHOUT 6102	U-7202	2
PLUNGER STAND COMPLETE	14253	2
PLUNGER LOCK PLATE	5940-8	2
ADJUSTABLE LINK (C. TO C. 15½")	10198	2
TIE PLATE	5940-6	3
RISER PLATE	5940-14	3
BUTT STRAP	5940-17	3
STRAP NUT	5940-13	3
TIE STRAP	5940-2	3
" " 16 FT. LONG (LEVER STAND & TIES)	5940	1
CRANK STAND COMPL. WITH 11¾" x 11¾" CRANK	10116	1
" " " " " T "	10111	1
" " " ONLY	10082	4
" R.H.	5840-8	2
" L.H.	5840-7	2
TRANSVERSE PIPE CARRIER	10721	2
STRAP " "	10714	38
PIPE, COUPLING AND PLUG WITH RIVET	1015	225 FT.
STRAIGHT TANG END SOLID JAW	10181	4
" " " SCREW " (OFFSET IN FIELD)	13605	2
" " " " "	10199	3
CROSS CONNECTING ROD COMPL.	5960-8	1
CROSS ROD COMPL.	5840-5	1
RAIL BRACE	2920-1	3
SW. CCT. CONTROLLER, HALL 2 POS. STYLE G-2		2
SW. CCT. CONTROLLER ROD,	4117	1
" " " "	U-7204	1

NAME	REF.	REQ'D.
BOLT SQ. HD. WITH HEX. NUT ¾" x 3½" (SW. LUG)		6
" " " " " " 2¾" (DW. MACH)		2
" " " " " ¾" x 3¼" "		2
BOLT SQ. HD. AND NUT ¾" x 2½" (P.L. & PL.)		8
" " " " ¾" x 9½" (CRANK STAND)		12
" " ONLY ⅞" x 3¾" (STRAP NUT)		6
WASHER ⅞" COML. LOCK (RAIL BRACE BOLT)		6
" ¾" " " (SW. LUG BOLT)		6
" C.I. (CRANK STAND)	14581	12
GUIDE COMPL. (DERAIL ROD)	450-3	1
PIN (1¼" JAW CONNECTION)	10105	17
COTTER 3/16" x 1½" (JAW PIN)		17
" 3/16" x 1¼" (¾" SW. LUG BOLT)		7
LAG SCREW ¾" x 8" (RAIL BRACE)		3
" " ¾" x 6" (TIE & BOLT LOCK PL. TIE STRAP, CCT. CONT. CRANK STAND)		54
" " ¾" x 4" (TRANS. P.C.)		4
" " ½" x 3" (STRAP P.C.)		76
RIVET RD. HD. ¾" x 3¼" (BUTT STRAP)		6
" CSK. HD. ¾" x 1¾" (RISER PL.)		9
DWARF MACHINE	Y-14	1
FOUNDATION	Y-14	1
TIMBERS 7" x 9" x 10'-0" 52.50		2
" 7" x 9" x 10'-6" 55.125		1
" 7" x 10" x 15'-0" 87.50		2
TOTAL F.B.M. 335.125		
DEFLECTING RAIL	U-108	1

U-100
REV. 4
3-7-29
SHEET 2 OF 2

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN No. 7638 WILL SUPERSEDE THIS PLAN.

N. Y. C. R. R.

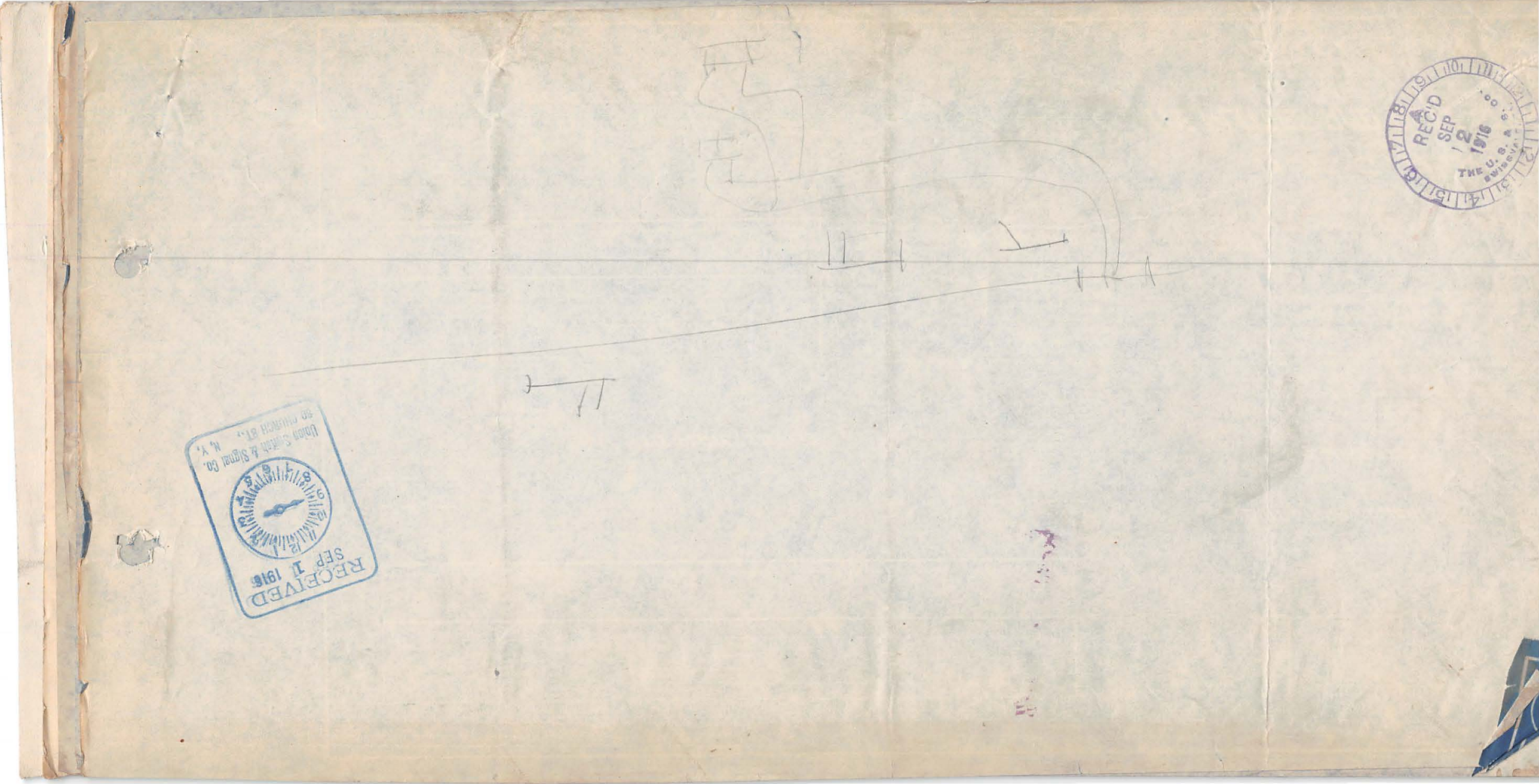
SIGNAL DEPARTMENT

OUTLYING SWITCH BOLT LOCK WITH SPLIT POINT DERAIL

ALBANY, MAY 1 – 1917.

W. H. Elliott 10/15/23

SIGNAL ENGINEER.


RECEIVED
SEP 11 1916
Lamb Simon & Signal Co.
90 CHURCH ST., N. Y.
RECD
SEP 2
1916
THE U. S. & S. SWISSVALE

NAME	REF.	REQ'D.
FRONT ROD	4116-A	1
DERAIL ROD (AS REQD.)	4116-B OR C	1
LOCK ROD COMPLETE WITHOUT 6102	U-7202	2
PLUNGER STAND COMPLETE	14253	2
PLUNGER LOCK PLATE	5940-8	2
ADJUSTABLE LINK (C. TO C. 15½")	10198	2
TIE PLATE	5940-6	3
RISER PLATE	5940-14	3
BUTT STRAP	5940-17	3
STRAP NUT	5940-13	3
TIE STRAP	5940-2	3
" " 16 FT. LONG (LEVER STAND & TIES)	5940	1
CRANK STAND COMPL. WITH 11¾" x 11¾" CRANK	10116	1
" " " " " T "	10111	1
" " " ONLY	10082	4
" R.H.	5840-8	2
" L.H.	5840-7	2
TRANSVERSE PIPE CARRIER	10721	2
STRAP " "	10714	38
PIPE, COUPLING AND PLUG WITH RIVET	1015	225 FT.
STRAIGHT TANG END SOLID JAW	10181	4
" " " SCREW " (OFFSET IN FIELD)	13605	2
" " " " "	10199	3
CROSS CONNECTING ROD COMPL.	5960-8	1
CROSS ROD COMPL.	5840-5	1
RAIL BRACE	2920-1	3
SW. CCT. CONTROLLER, HALL 2 POS. STYLE G-2		2
SW. CCT. CONTROLLER ROD,	4117	1
" " " "	U-7204	1

NAME	REF.	REQ'D.
BOLT SQ. HD. WITH HEX. NUT ¾" x 3½" (SW. LUG)		6
" " " " " " 2¾" (DW. MACH.)		2
" " " " " ¾" x 3¼" "		2
BOLT SQ. HD. AND NUT ¾" x 2½" (P.L. & PL.)		8
" " " " ¾" x 9½" (CRANK STAND)		12
" " ONLY ⅞" x 3¾" (STRAP NUT)		6
WASHER ⅞" COML. LOCK (RAIL BRACE BOLT)		6
" ¾" " " (SW. LUG BOLT)		6
" C.I. (CRANK STAND)	14581	12
GUIDE COMPL. (DERAIL ROD)	450-3	1
PIN (1¼" JAW CONNECTION)	10105	17
COTTER 3/16" x 1½" (JAW PIN)		17
" 3/16" x 1¼" (¾" SW. LUG BOLT)		7
LAG SCREW ¾" x 8" (RAIL BRACE)		3
" " ¾" x 6" (TIE & BOLT LOCK PL. TIE STRAP, CCT. CONT. CRANK STAND)		54
" " ¾" x 4" (TRANS. P.C.)		4
" " ½" x 3" (STRAP P.C.)		76
RIVET RD. HD. ¾" x 3¼" (BUTT STRAP)		6
" CSK. HD. ¾" x 1¾" (RISER PL.)		9
DWARF MACHINE	Y-14	1
FOUNDATION	Y-14	1
TIMBERS 7" x 9" x 10'-0" 52.50		2
" 7" x 9" x 10'-6" 55.125		1
" 7" x 10" x 15'-0" 87.50		2
TOTAL F.B.M. 335.125		
DEFLECTING RAIL	U-108	1

U-100
REV. 4
3-7-29
SHEET 2 OF 2

NOTE: WHEN M. OF W. TIE PLATES EC-H23 AND EC-H23A ARE USED PLAN NO. 7638 WILL SUPERSEDE THIS PLAN.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

OUTLYING SWITCH BOLT LOCK WITH SPLIT POINT DERAIL

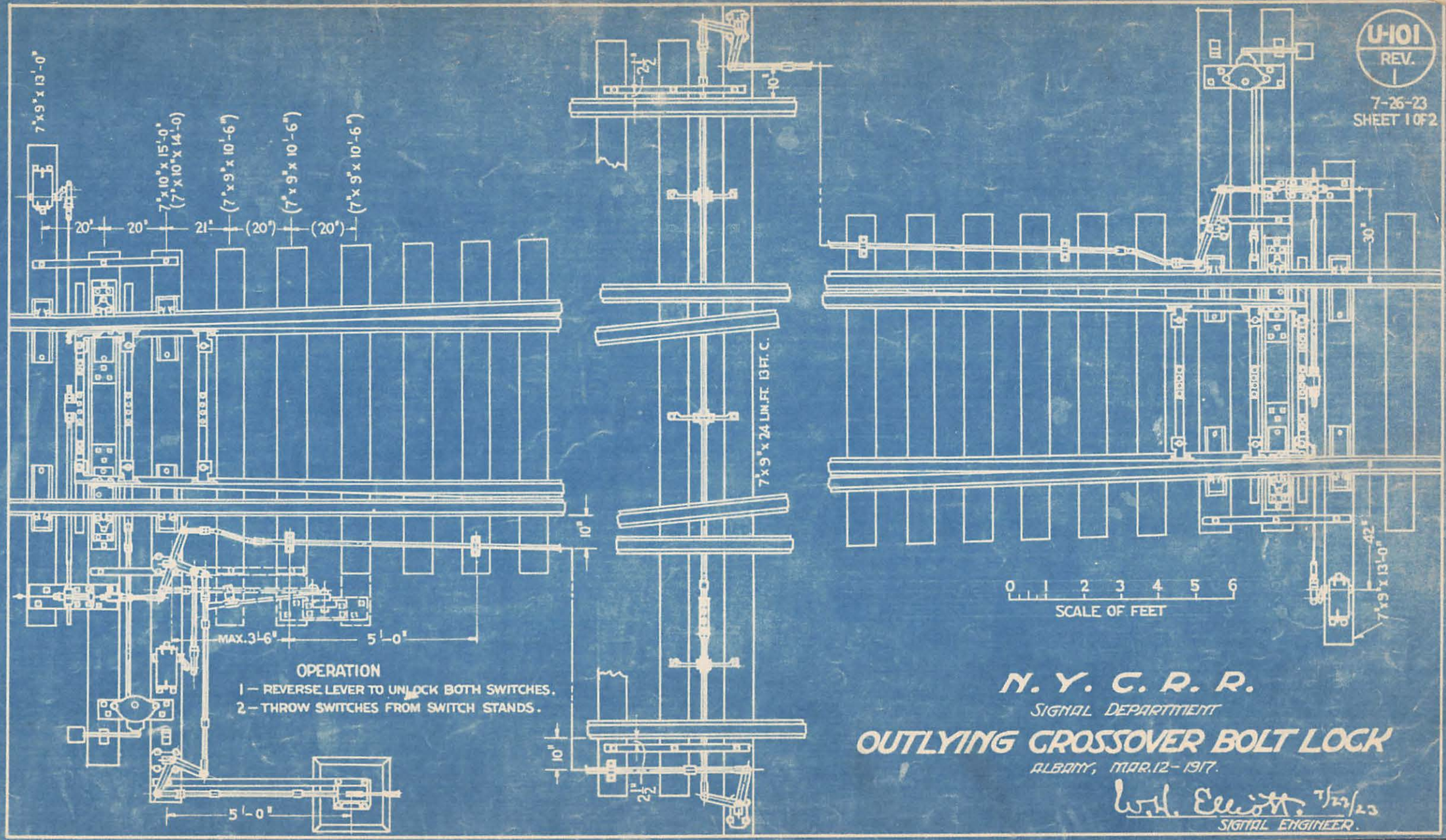
ALBANY, MAY 1 - 1917.

W. H. Elliott 10/5/23
SIGNAL ENGINEER.

DEPT. OF
MAY 11
1929

U-101
REV. 1

7-26-23
SHEET 1 OF 2



N. Y. C. R. R.

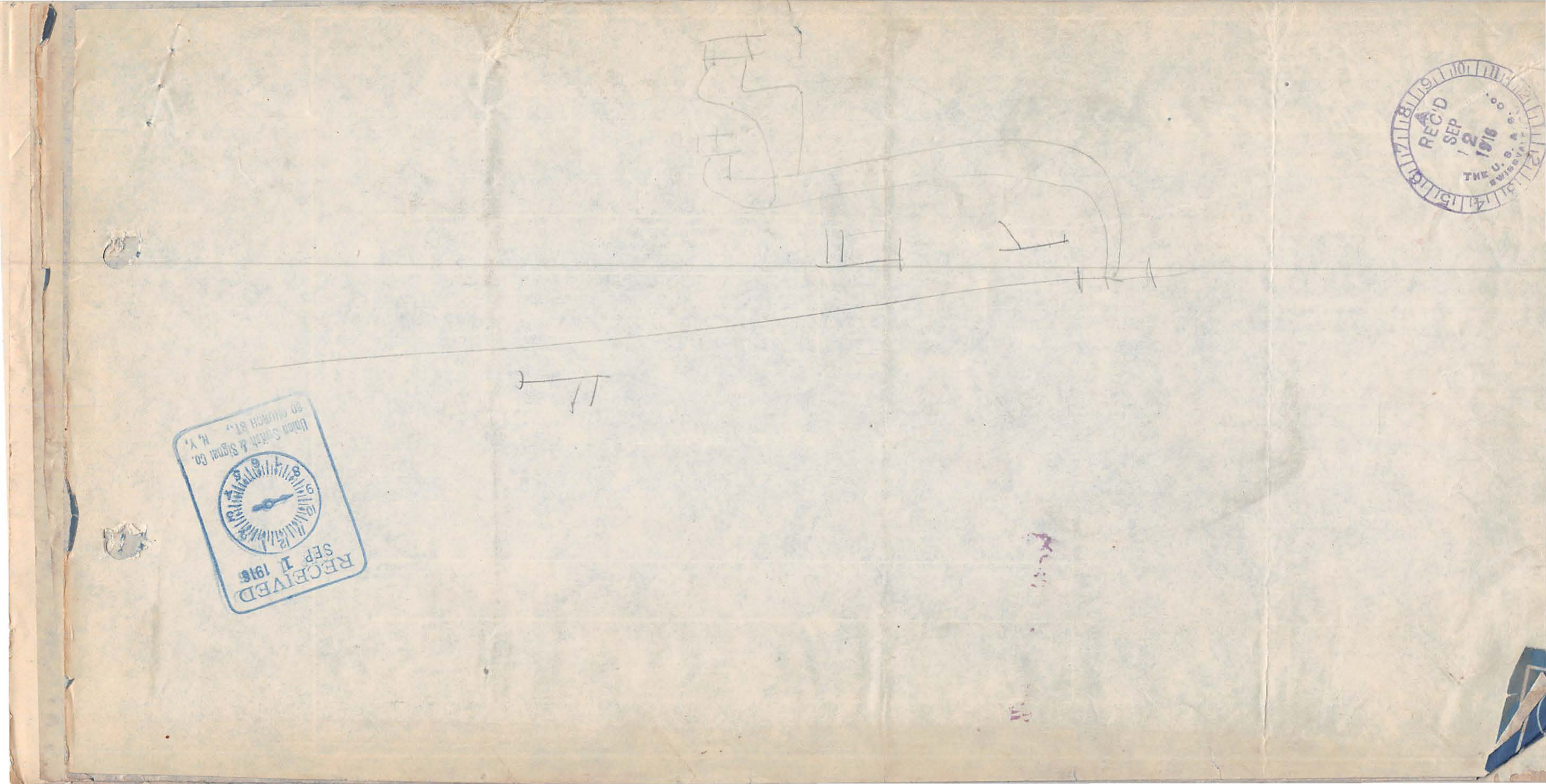
SIGNAL DEPARTMENT

OUTLYING CROSSOVER BOLT LOCK

ALBANY, MAR. 12 - 1917.

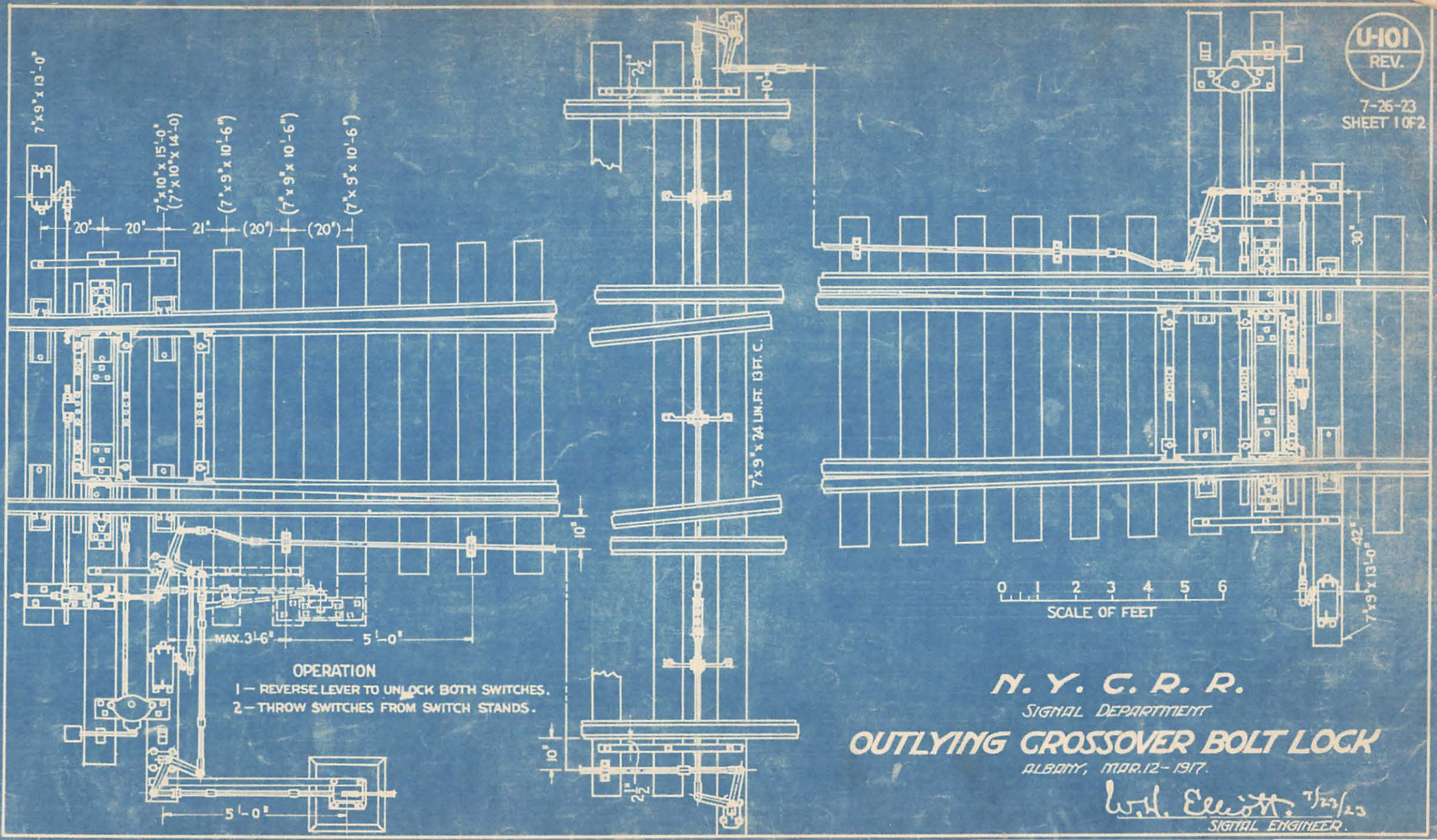
W. H. Elliott 7/27/23

SIGNAL ENGINEER.


RECEIVED
SEP 12 1916
THE U. S. & S. Co.
RECEIVED
SEP 11 1916
Union Switch & Signal Co.
50 CHURCH ST., N. Y.

U-101
REV. 1

7-26-23
SHEET 1 OF 2



N. Y. C. R. R.

SIGNAL DEPARTMENT

OUTLYING CROSSOVER BOLT LOCK

ALBANY, MAR. 12 - 1917.

W. H. Elliott 7/27/23

SIGNAL ENGINEER.

NAME	REF.	REQ'D.
FRONT ROD	5990-14	2
LUG	U 8801-U 8802	2 OF EACH
" (80 LB. RAIL)	U 8803-U 8804	2 OF EACH
LOCK ROD	U 7201	2
BOLT LOCK	1901	2
ADJUSTABLE LINK	10198	2
TIE PLATE	5940-6	4
RISER PLATE	5940-10	4
PLUNGER LOCK PLATE (DRILLED TO FIT 1901)	5940-8	2
BUTT STRAP	5940-7	4
STRAP NUT	5940-9	4
TIE STRAP	5940-2	4
○ " " 30 INS. LONG (CRANK STAND)	5940	2
* " " 7 FT. " (LEVER STAND)	5940	1
CRANK STAND COMPL.	10082	2
* CRANK STAND COMPL. WITH 11¾" x 11¾" CRANK	10116	1
" " " " " STRAIGHT ARM	10113	1
" " " " " T CRANK	10111	1
CRANK R.H. 11¾" x 11¾"	5840-8	1
L.H. " "	5840-7	1
TRANSVERSE PIPE CARRIER	10721	3
STRAP " "	10714	36
PIPE, COUPLING AND PLUG WITH RIVET	1015	225 FT.
○ STRAIGHT TANG END SCREW JAW (OFFSET IN FIELD)	13605	5
○ STRAIGHT TANG END SOLID JAW	10181	4
CROSS CONNECTING ROD COMPL. - INSULATED.	5960-8	1
RAIL BRACE	2920-1	4
" " (80 LB. RAIL)	2920-2	4
SW. CCT. CONTROLLER, HALL 2 POS. STYLE G-2		3
SW. CCT. CONTROLLER ROD, R.H.	6363	2
" " " L.H.	6367	2
" " "	U-7202	1

NAME	REF.	REQ'D.
BOLT SQ. HD. WITH HEX. NUT 1" x 5" TURNED (SW. LUG)		4
BOLT SQ. HD. WITH HEX. NUT ¾" x 4" (SW. LUG)		2
" " " " ¾" x 3½" "		6
" " " " ¾" x 2¾" "		2
* " " " " " " (DW. MACH.)		2
* " " " " ¾" x 3¼" "		2
BOLT SQ. HD. AND NUT ¾" x 2¼" (BOLT LOCK)		8
○ " " " " ¾" x 9½" (CRANK STAND)		10
" " ONLY ⅞" x 3¾" (STRAP NUT)		8
WASHER 1" COM'L LOCK (SW. LUG BOLT)		4
" ⅞" " " (RAIL BRACE BOLT)		8
" ¾" " " (SW. LUG BOLT)		10
○ " C.I. (CRANK STAND)	14581	10
○ PIN (1¼" JAW CONNECTION)	10105	15
○ COTTER 3/16" x 1½" (JAW PIN)		15
" 3/16" x 1¼" (¾" SW. LUG BOLT)		10
" ¼" x 1¾" (1" " " ")		4
LAG SCREW ¾" x 8" (RAIL BRACE)		4
○ " " ¾" x 6" (TIE & P.L. PL., TIE STRAP, CCT. CONT. CRANK STAND.)		58
○ " " ¾" x 4" (TRANS. P.C.)		6
" " ½" x 3" (STRAP P.C.)		72
RIVET RD. HD. ¾" x 2¾" (BUTT STRAP)		8
" CSK. HD. ¾" x 1¾" (RISER PL.)		8
* DWARF MACHINE	Y-14	1
* FOUNDATION	Y-14	1
TIMBER 7" x 9" x 13'-0" B.M. 68.25		2
" 7" x 9" x 24 LIN. FT. (13 FT. C.) " 126.		1
* " 7" x 10" x 15'-0" " 87.50		1
○ TOTAL F.B.M. 350.00		1

NOTE:

* NOT REQUIRED WHEN THROW OVER LEVER IS USED.

○ SEE SUPPLEMENTARY TABLE.

U-101 REV. 1

7-26-23

SHEET 2 OF 2

SUPPLEMENTARY TABLE FOR USE WHEN THROW OVER LEVER IS REQUIRED

NAME	REF.	REQ'D.
THROW OVER LEVER	U-8701	1
TIE STRAP 30 INS. LONG	5940	1
" " 5'-7"	5940	1
STRAIGHT TANG END SCREW JAW (OFFSET IN FIELD)		3
STRAIGHT TANG END SOLID JAW	10181	2
BOLT SQ. HD. AND NUT ¾" x 9½" (CRANK STAND)		8
WASHER C.I. (CRANK STAND)	14581	8
PIN (1¼" JAW CONNECTION)	10105	12
COTTER 3/16" x 1½" (JAW PIN)		12
LAG SCREW ¾" x 6" (TIE & P.L. PL., TIE STRAP, CCT. CONT.: CRANK STAND, THROW OVER LEVER.)		61
" " ¾" x 4" (TRANS. P.C.-THROW OVER LEVER		8
TIMBER 7" x 9" x 10'-6" B.M. 55.125		3
TOTAL F.B.M. 427.875		

N. Y. C. R. R.

SIGNAL DEPARTMENT

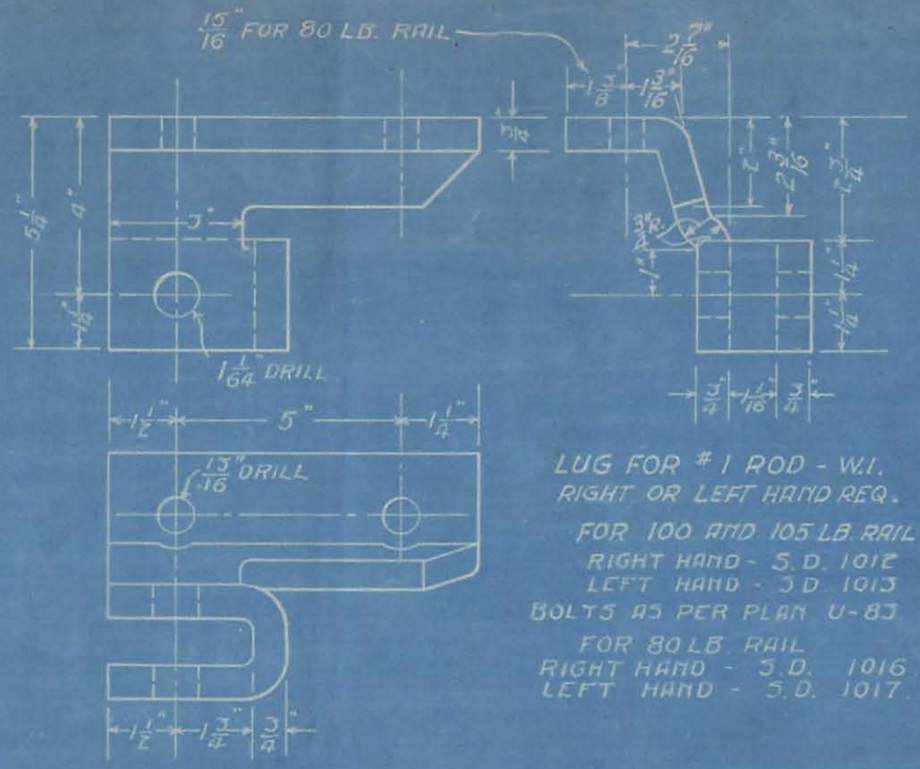
OUTLYING CROSSOVER BOLT LOCK

ALBANY, MARCH 12-1917

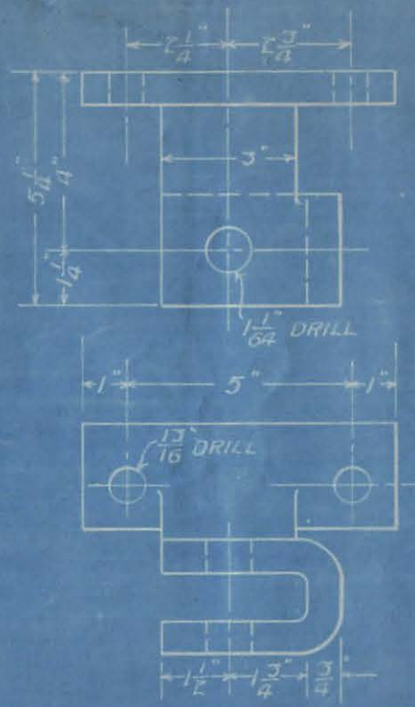
W. H. Elliott 7/27/23

SIGNAL ENGINEER

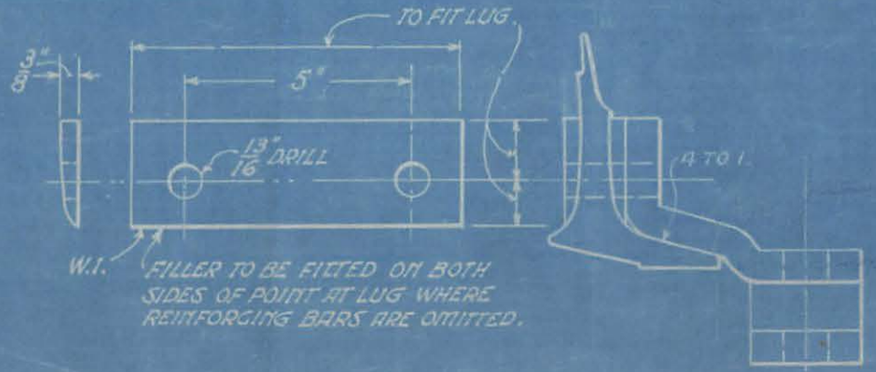
U-102
REV. 1



LUG FOR # 1 ROD - W.I.
RIGHT OR LEFT HAND REQ.
FOR 100 AND 105 LB. RAIL.
RIGHT HAND - S.D. 1012
LEFT HAND - S.D. 1013
BOLTS AS PER PLAN U-83
FOR 80 LB. RAIL
RIGHT HAND - S.D. 1016
LEFT HAND - S.D. 1017



LUG FOR # 2 ROD - W.I.
RIGHT OR LEFT HAND REQ.
FOR 80, 100 AND 105 LB. RAIL.
RIGHT HAND - S.D. 1014
LEFT HAND - S.D. 1015
BOLTS AS PER PLAN U-83



LUG AND FILLERS TO FIT POINT AS SHOWN.

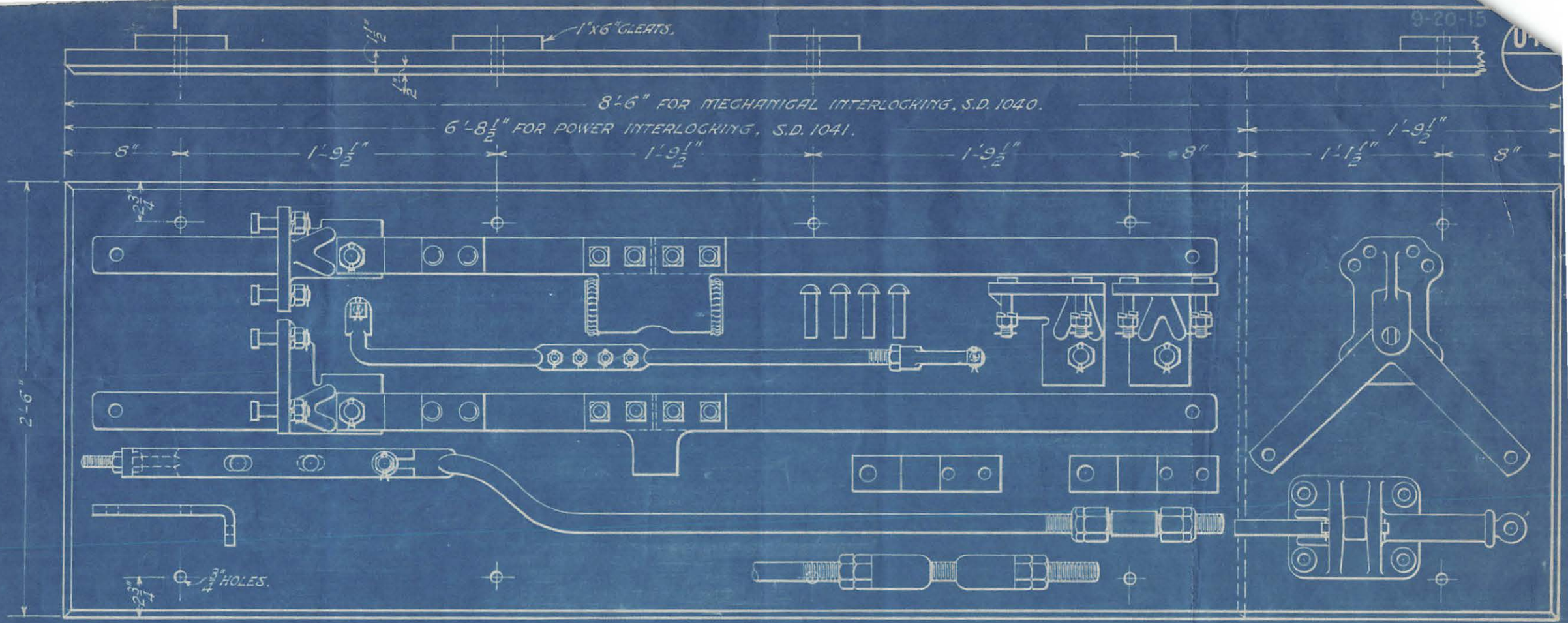
N.Y.C.R.R.
SIGNAL DEPT
SPECIAL LUGS.
MOVABLE POINT FROGS.

SCALE: 3"=1'. ALBANY, JUNE 5-1915.

W. H. Elliott. 4/10/15
SIGNAL ENGR.

RECEIVED
APR
10
1916
THE U.S. S. & S. CO.

9-20-15



NOTES: BOARD SHALL BE MADE OF WELL SEASONED PINE AND GIVEN ONE COAT FILLER AND TWO COATS VARNISH.
BOARD SHALL BE FASTENED TO WALL WITH ⅜" X 6" LAG SCREWS AND WASHERS.
PARTS SHALL BE OF TYPE IN SERVICE AT INTERLOCKING.
EMERGENCY EQUIPMENT SHALL BE SECURELY FASTENED TO BOARD WITH SUITABLE STRAPS OR HOOKS.
ALL APPARATUS EXCEPT THREADED PARTS TO BE PAINTED **BLACK.**

N. Y. C. R. R.

SIGNAL DEPARTMENT.

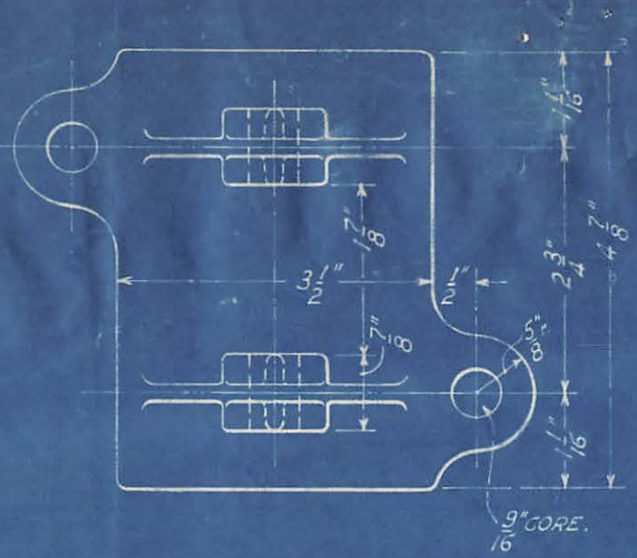
EMERGENCY INTERLOCKING SWITCH FITTINGS.

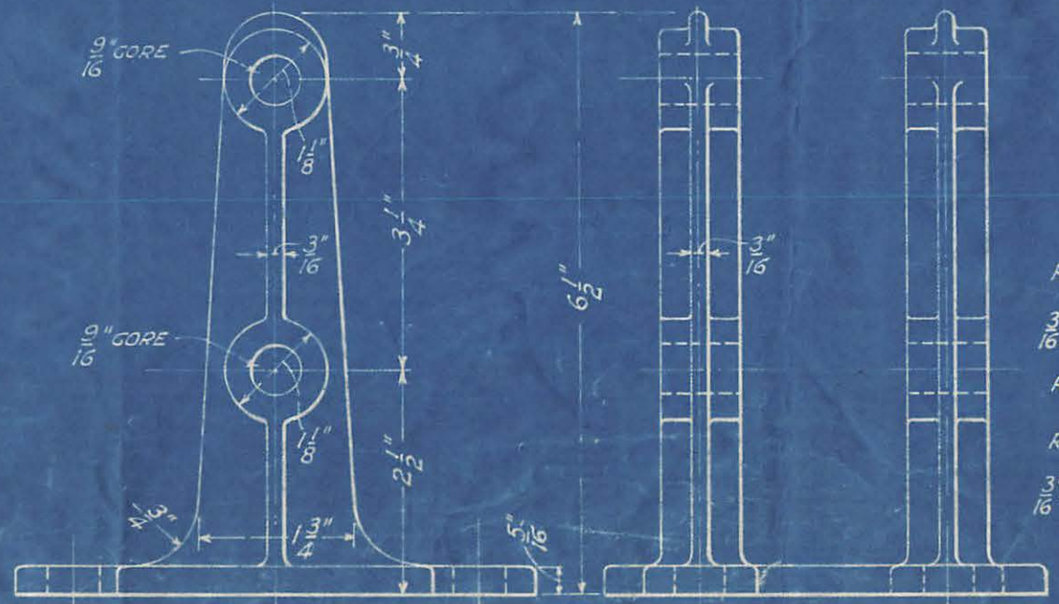
SCALE: 1½"=1'-0" ALBANY, SEPT. 20 1915.

W. H. Elliott 9/22/15

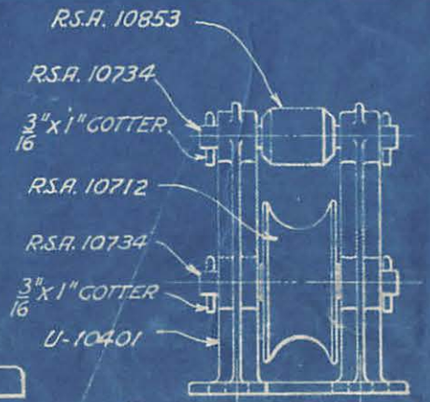
SIGNAL ENGINEER.

RECD
SEP
28
1915





BASE, GREY IRON, U-10401.



ASSEMBLY, U-10402.
SCALE: 3"=1'-0".

N.Y.C.R.R.

SIGNAL DEPARTMENT.

PIPE GUIDE, UP AND DOWN ROD.

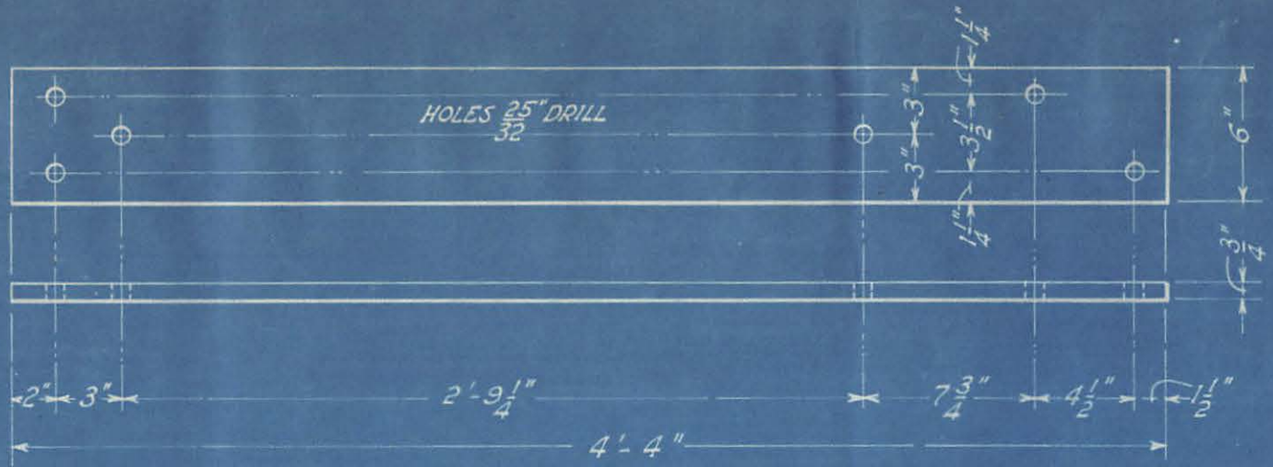
SCALE: HALF SIZE ALBANY, NOV. 19 1915.

W.H. Elliott 11/20/15
SIGNAL ENGINEER.

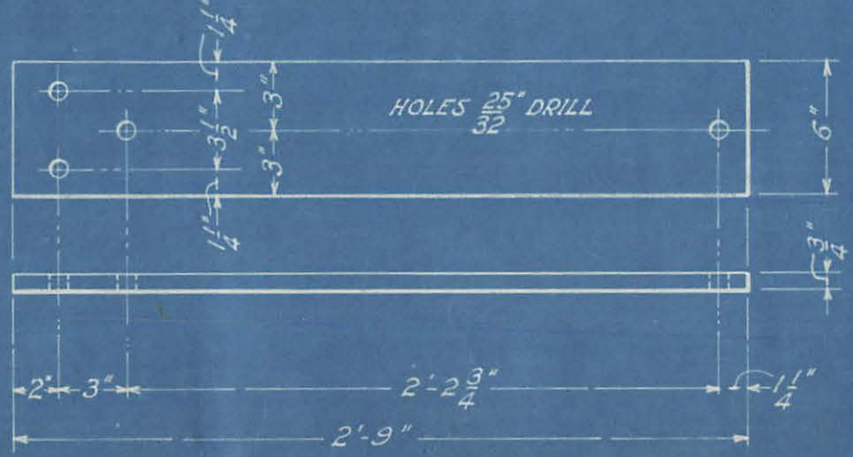
REV.

U-105

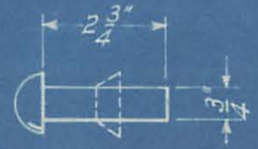
8-28-16



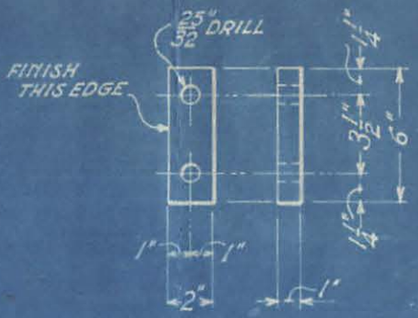
TIE PLATE, S.D. 1059.



TIE PLATE, S.D. 1060.



RD. HD. IRON RIVET.



BUTT STRAP S.D. 1061.

SPECIFICATION.

TIE PLATES AND BUTT STRAPS SHALL BE OF OPEN HEARTH STEEL AND MAY BE PROCURED FROM THE LACKAWANNA STEEL CO. THEY SHALL BE OF THE FOLLOWING COMPOSITION:

CARBON	.35 TO .40
MANGANESE	.40 " .60
SULPHUR NOT TO EXCEED	.04
PHOSPHORUS NOT TO EXCEED	.04

NOTE:

FOR TIE PLATES FOR No 10 DOUBLE SLIPS, SEE PLAN 3016.

N.Y.C.R.R.

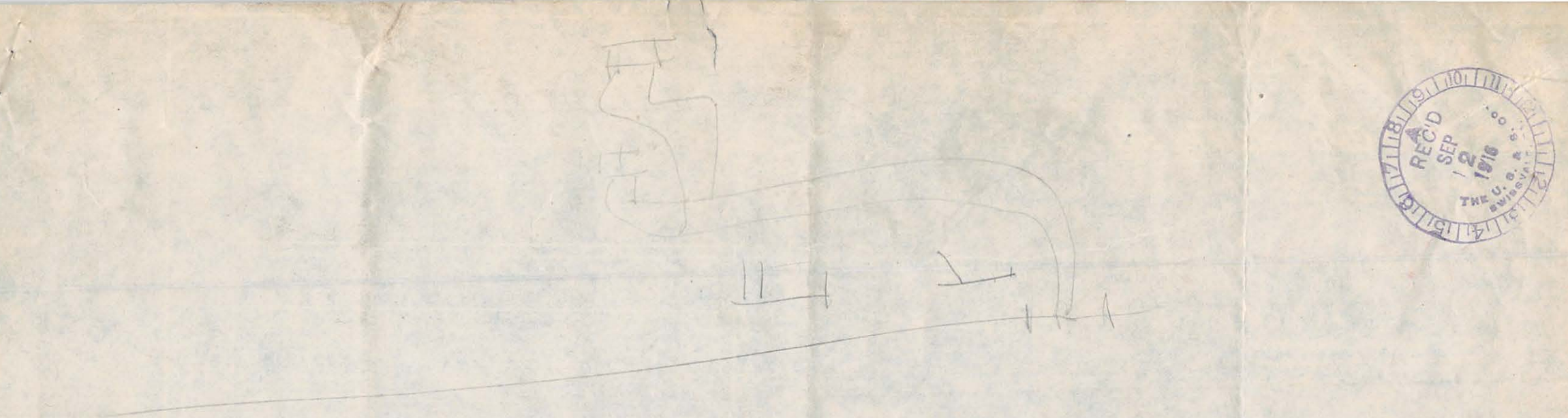
SIGNAL DEPARTMENT.

TIE PLATES AND BUTT STRAP.

SCALE: 1½" = 1'-0". ALBANY. AUG. 28TH 1916

W. J. Elliott 9/29/16.

SIGNAL ENGINEER.



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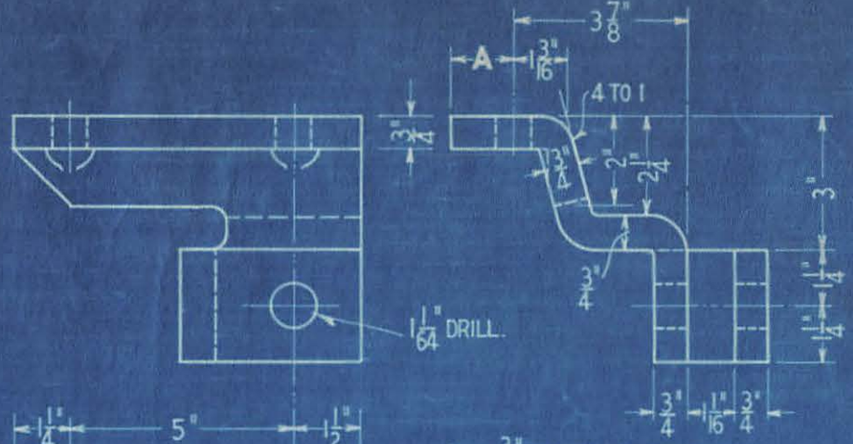
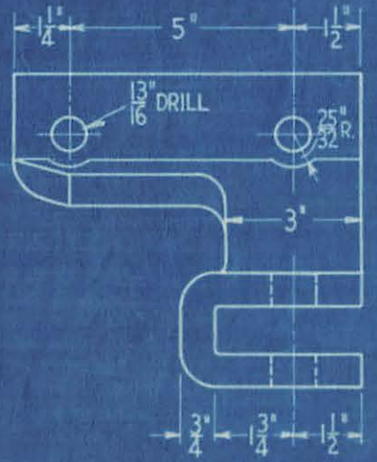
SEP 12 1916
THE U. S. & S. SWITZERLAND

RECEIVED
SEP 11 1916
Union Switch & Signal Co.
30 CHURCH ST., N. Y.

U-106 REV.

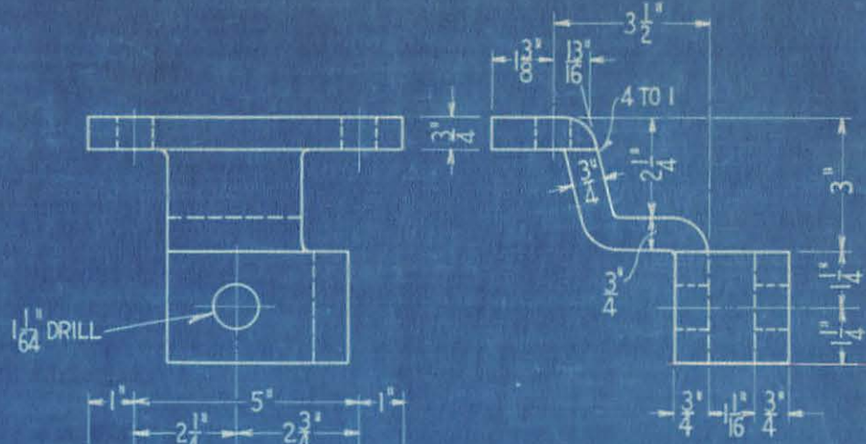


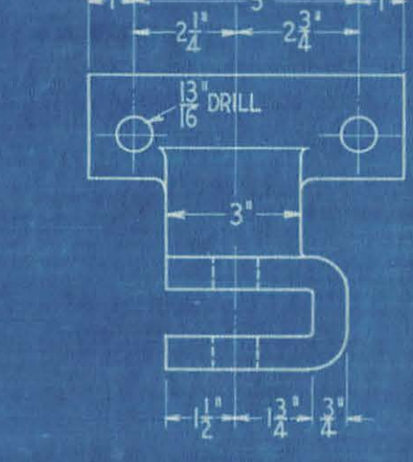


A = 1 3/8" FOR 100 OR 105 LB. RAIL
" = 15/16" FOR 80 LB. RAIL.

LUG NO. 1 ROD. O.H. STEEL
(RIGHT HAND SHOWN)

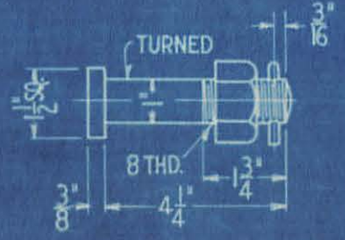
U-10601 RIGHT HAND FOR 100 OR 105 LB. RAIL
U-10602 LEFT HAND " " "
U-10603 RIGHT HAND FOR 80 LB. RAIL
U-10604 LEFT HAND " "



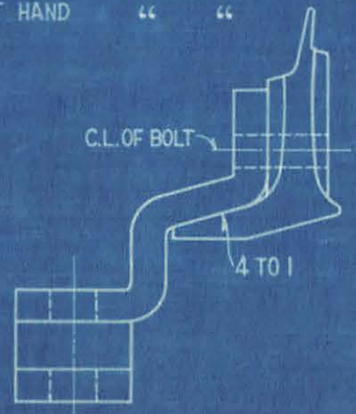


LUG NO. 2 ROD. O.H. STEEL
(RIGHT HAND SHOWN).

U-10605 RIGHT HAND FOR 80. 100 OR 105 LB. RAIL
U-10606 LEFT HAND " " " "



U-10607 TURNED BOLT.
MACH. STEEL



LUGS FOR NO. 1 AND NO. 2 RODS
SHALL FIT RAIL AS SHOWN.

N. Y. C. R. R.

SIGNAL DEPARTMENT

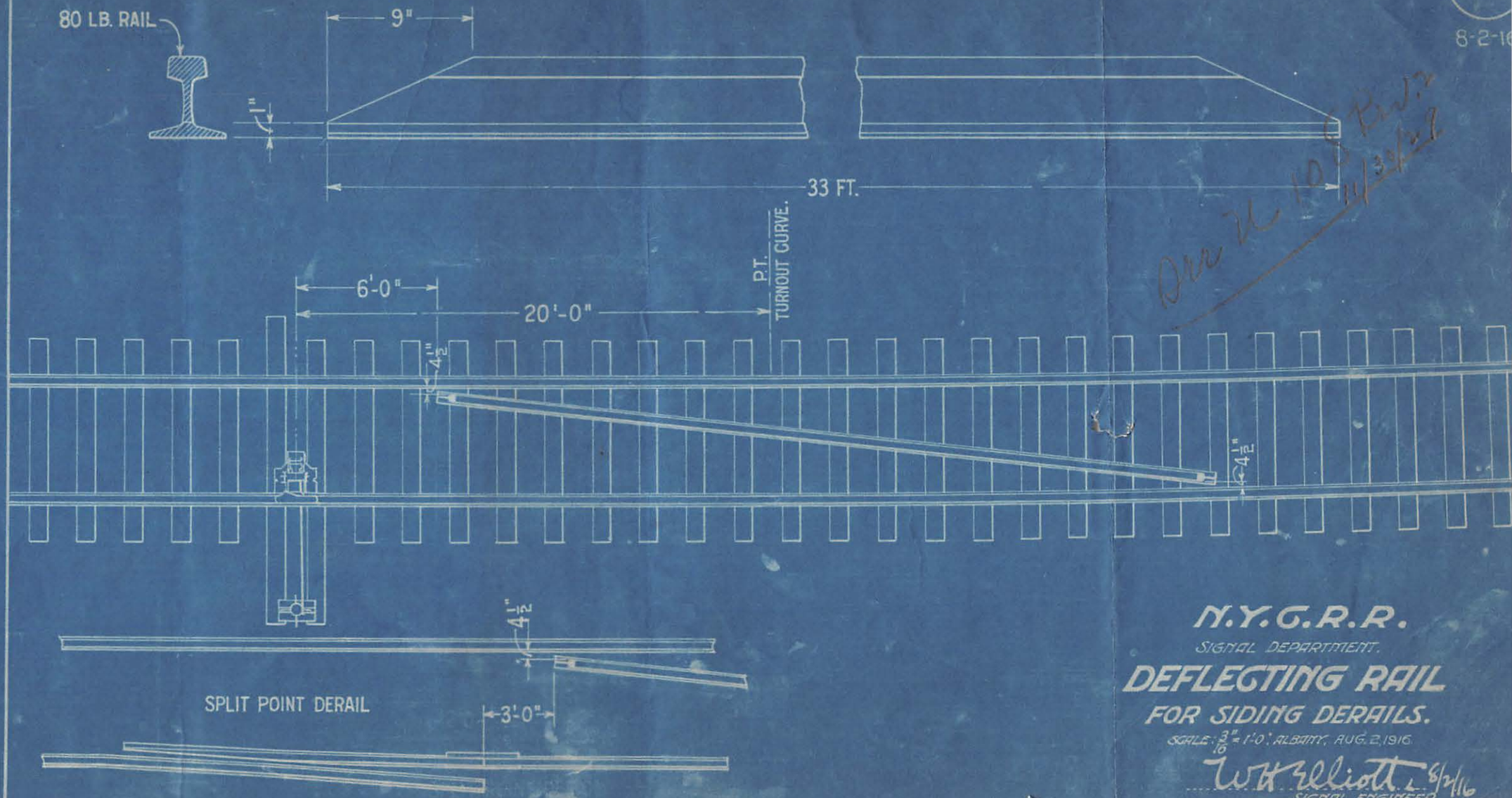
MOVABLE POINT FROG LUGS
NO. 7 FROG

SCALE: 3" = 1'-0" ALBANY, APRIL 28 - 1916.

W. H. Elliott 6/15/24
SIGNAL ENGINEER.

U-108

8-2-16



Dec 2 10 P.M. 11/30/17

N.Y.C.R.R.

SIGNAL DEPARTMENT.

DEFLECTING RAIL FOR SIDING DERAILS.

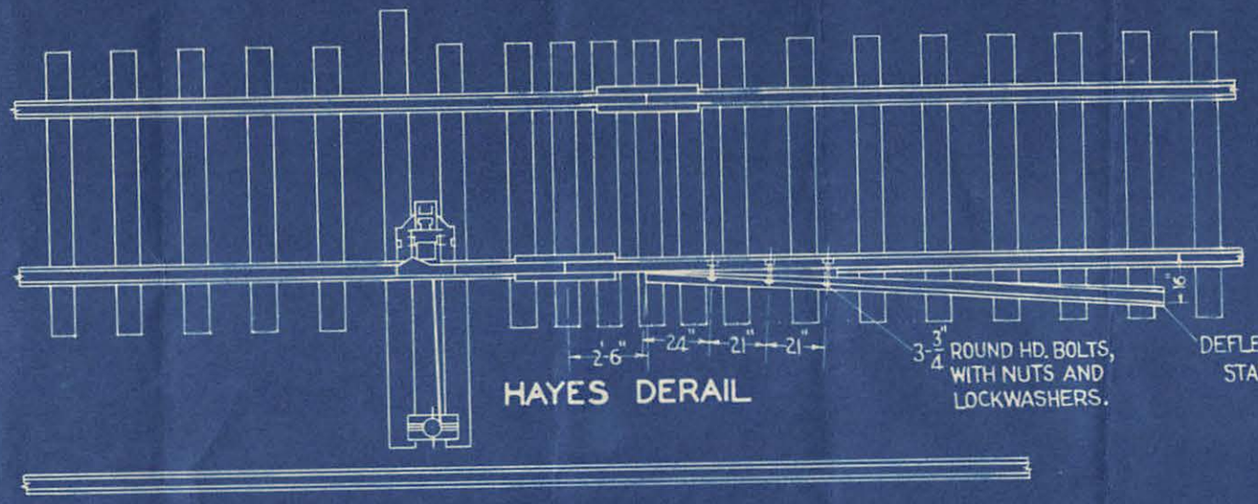
SCALE: 3/16" = 1'-0". ALBANY, AUG. 2, 1916.

W. K. Elliott 8/2/16

SIGNAL ENGINEER.

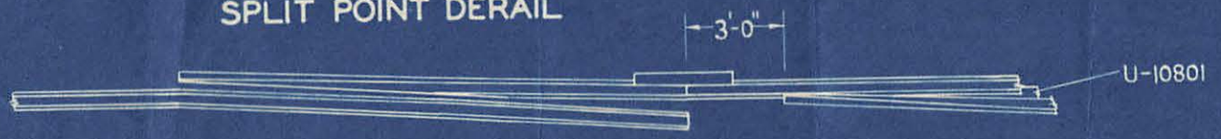
RECD
AUG 6
1918
THE U. S. CIVIL SERVICE COMMISSION

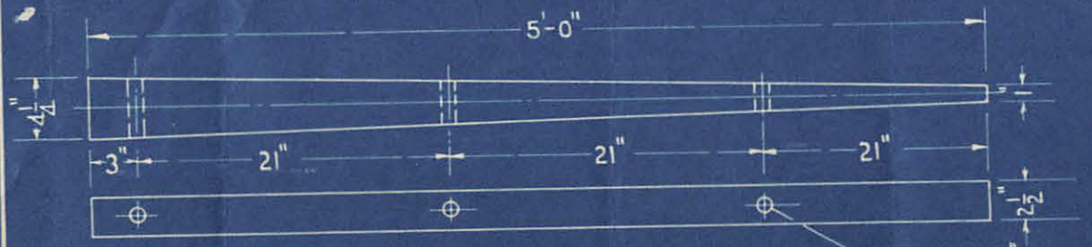
U-108
REV. 2
11-30-29


2'-6"
24"
21"
21"
3-¾" ROUND HD. BOLTS, WITH NUTS AND LOCKWASHERS.
DEFLECTING RAIL TO BE MADE FROM USED STANDARD 15FT. SPLIT SWITCH POINT.

HAYES DERAIL

SPLIT POINT DERAIL





U-10801 FILLER BLOCK, OAK.

N. Y. C. R. R.
SIGNAL DEPARTMENT

DEFLECTING RAIL
FOR SIDING DERAILS

SCALES 3/16 & 1"=1'-0" ALBANY AUG. 2, 1916.

W. H. Elliott 12/2/29
SIGNAL ENGR

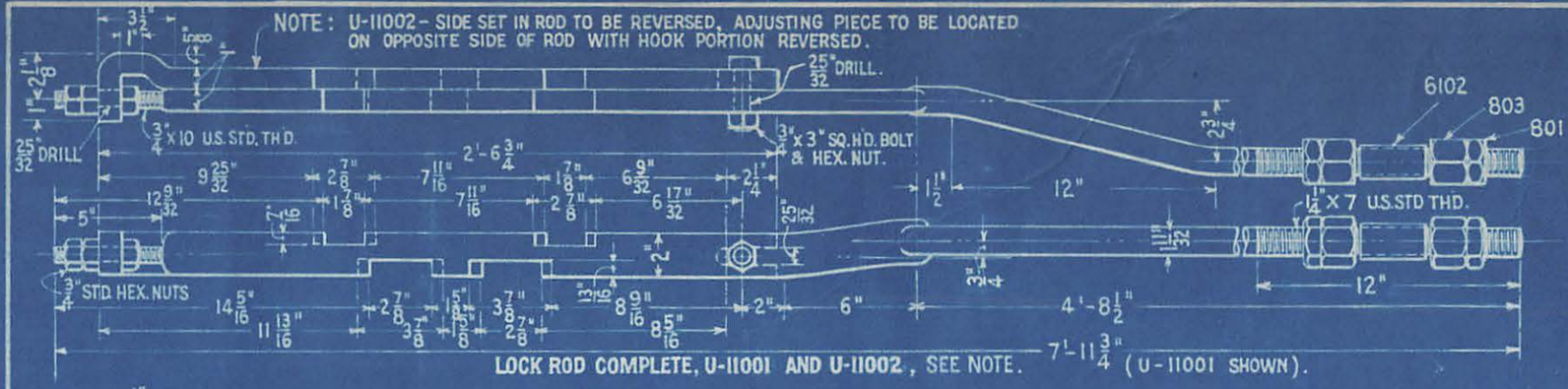
~~R. S. Lovett~~

P. F. Willard

U-110

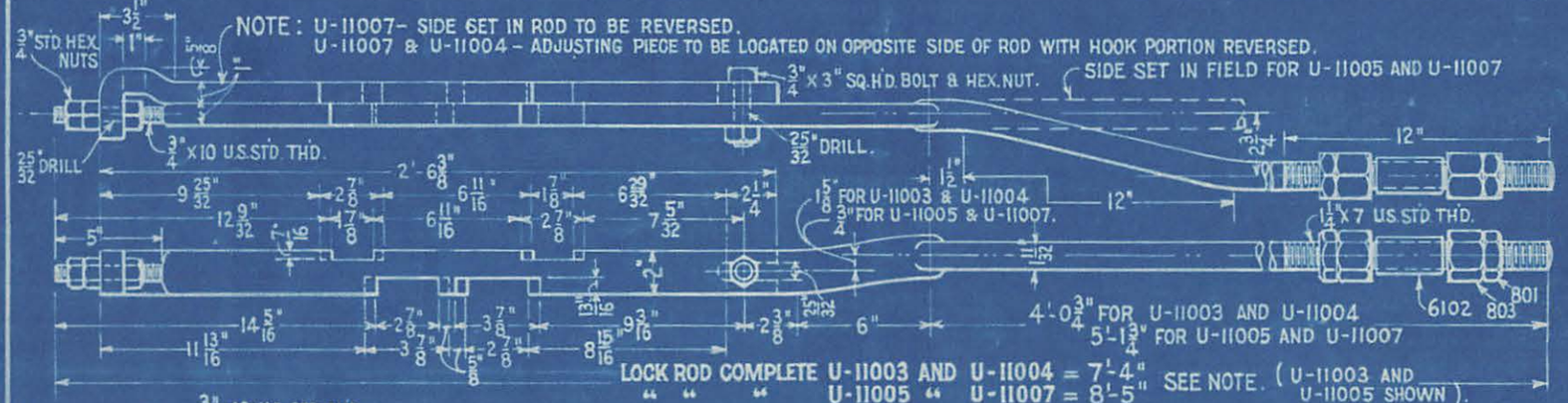
2-5-18

NOTE: U-11002 - SIDE SET IN ROD TO BE REVERSED, ADJUSTING PIECE TO BE LOCATED ON OPPOSITE SIDE OF ROD WITH HOOK PORTION REVERSED.

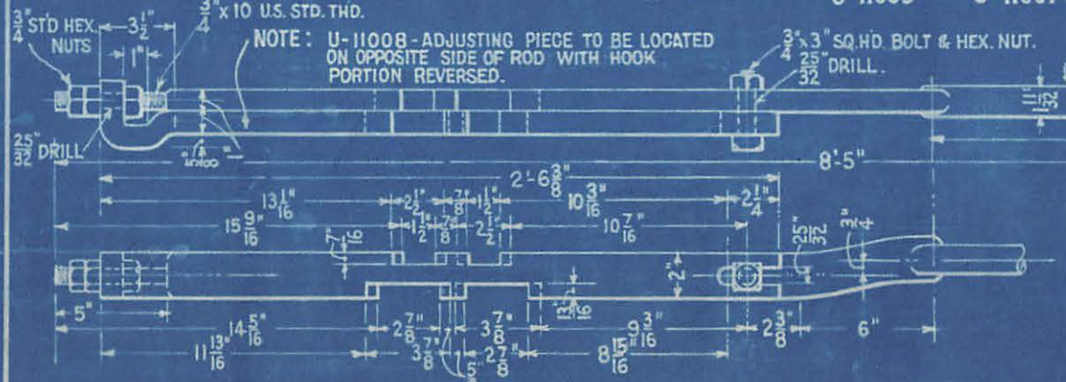


LOCK ROD COMPLETE, U-11001 AND U-11002, SEE NOTE. 7'-11 3/4" (U-11001 SHOWN).

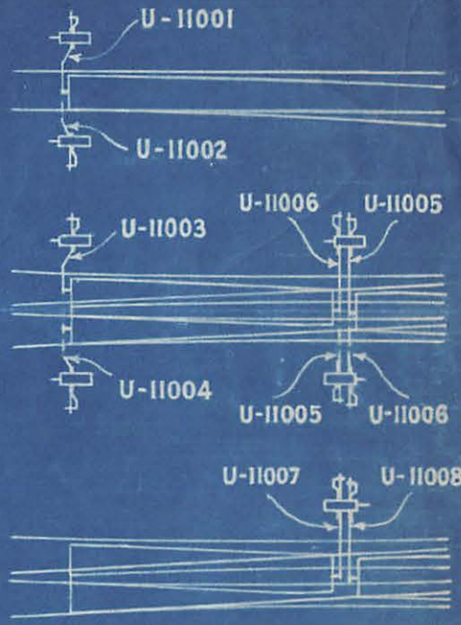
NOTE: U-11007 - SIDE SET IN ROD TO BE REVERSED.
U-11007 & U-11004 - ADJUSTING PIECE TO BE LOCATED ON OPPOSITE SIDE OF ROD WITH HOOK PORTION REVERSED.



LOCK ROD COMPLETE U-11003 AND U-11004 = 7'-4"
" " " U-11005 " U-11007 = 8'-5" SEE NOTE. (U-11003 AND U-11005 SHOWN).


3/4" STD HEX. NUTS
3/4" X 10 U.S. STD. THD.
NOTE: U-11008 - ADJUSTING PIECE TO BE LOCATED ON OPPOSITE SIDE OF ROD WITH HOOK PORTION REVERSED.
3/4" X 3" SQ. HD. BOLT & HEX. NUT.
25/32" DRILL.
SIDE SET IN FIELD.
12"
1" X 7 U.S.STD. THD.
803
6102
801
8'-5"
4'-1 3/4"
2'-6 3/8"

LOCK ROD COMPLETE U-11006 AND U-11008, SEE NOTE. (U-11006 SHOWN).



DIAGRAMS SHOWING POSITION OF SIDE SETS AND ADJUSTING PIECES IN RELATION TO LOCATION OF SWITCH MACHINES AND ORDER NUMBERS.

N.Y.C.R.R.

SIGNAL DEPT.

LOCK RODS,

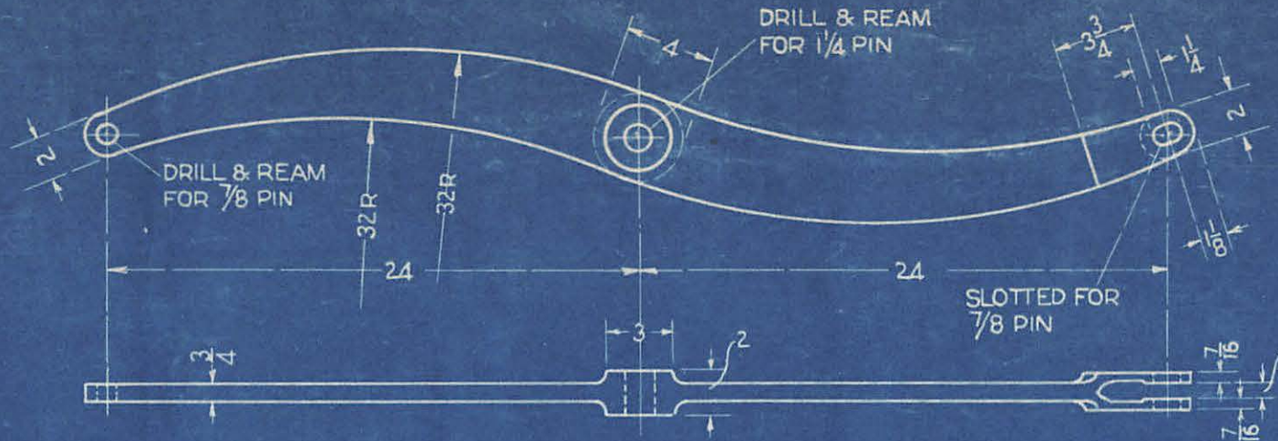
SWITCH, DOUBLE SLIP AND FROGS, FEDERAL TYPE 4 SW. MACHINE.

SCALE: 1 1/2" = 1'-0". ALBANY, FEB. 5TH 1918.

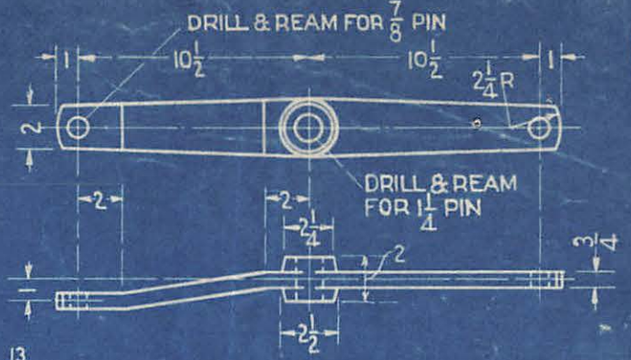
W. H. Elliott 2/6/18.

SIGNAL ENGINEER.

U-415
REV. 1
1-11-32

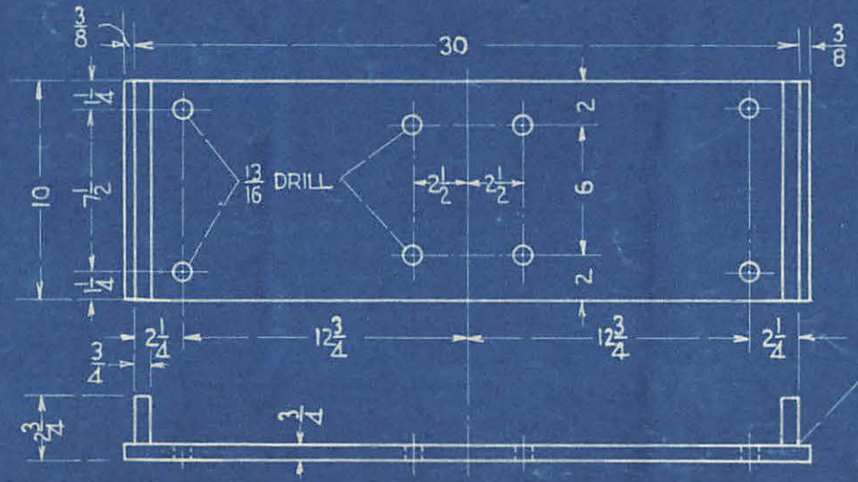


U-11501 CRANK M.P. FROG
FORGED STEEL

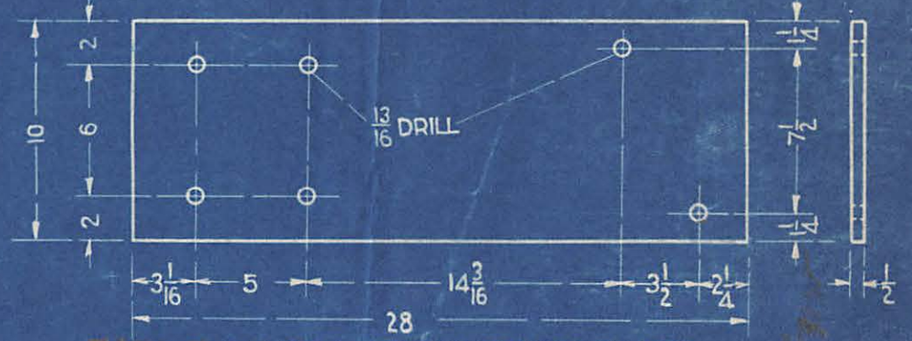


U-11503 CRANK HAYES DERAIL
FORGED STEEL

7671-C



U-11502 CRANK STAND PLATE M.P. FROG
MILD STEEL



7671-B U-11504 CRANK STAND PLATE
HAYES DERAIL MILD STEEL

N. Y. C. R. R.
SIGNAL DEPT.- BUFFALO AND EAST

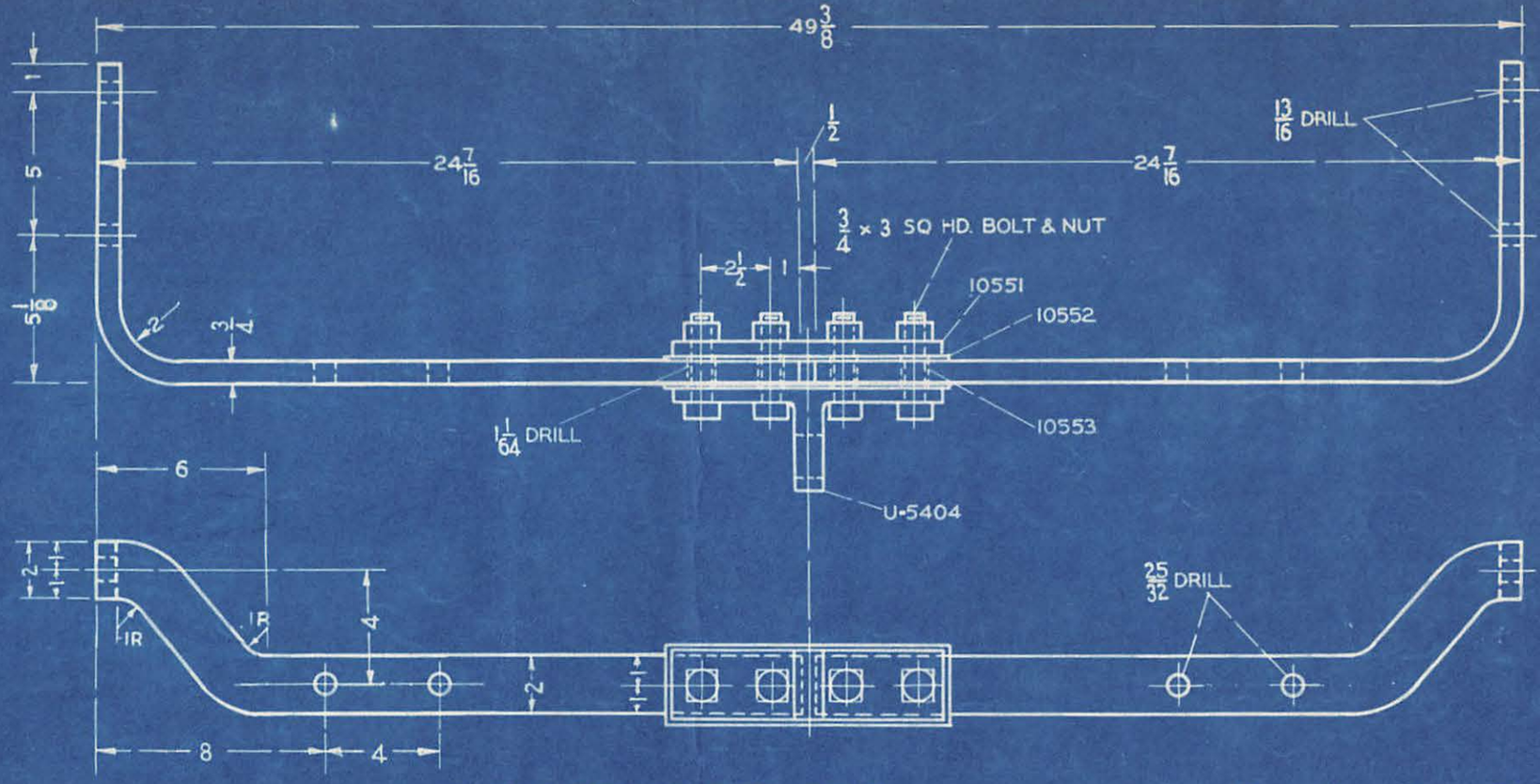
CRANK AND PLATE

105&127LB. RAIL G.R.S. MODEL 4A

ALBANY OCT. 29, 1930.

W. H. Elliott 12/1/30.
SIGNAL ENGR.

JAN 30 1932
A. M.
NOTE
ATTENTION
Ans'd
Date



U-13101 FRONT ROD COMPL. SINGLE SLIP
O.H STEEL

0 3 6 9 12
SCALE OF INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

FRONT ROD
105 LB. RAIL SINGLE SLIP

ALBANY MAR. 10 1931

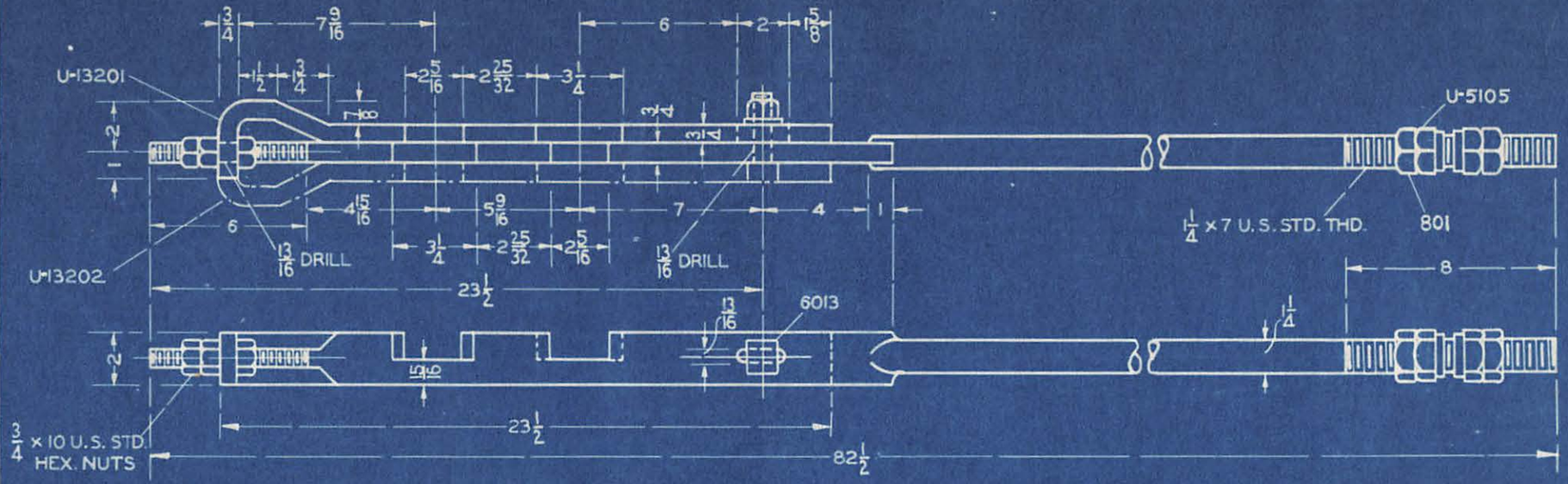
W. A. Elliott. 3/20/31.
SIGNAL ENGR.

U-13
3-10

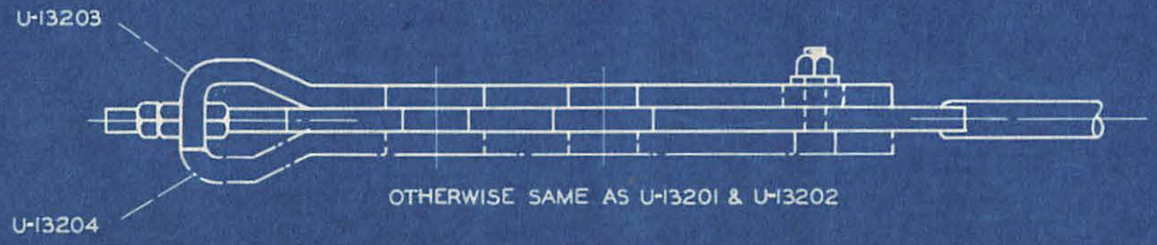
DEPT. 21
APR 15 1931
S. S. S. CO.

U-132

3-10-3



U-13201 LOCK ROD COMPL. SINGLE SLIP R.H. CLOSED POINT SIDE
U-13202 " " " " " L.H. " " "
O.H. STEEL



OTHERWISE SAME AS U-13201 & U-13202

U-13203 LOCK ROD COMPL. SINGLE SLIP R.H. OPEN POINT SIDE
U-13204 " " " " " L.H. " " "

0 3 6 9 12
SCALE OF INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

LOCK RODS

105 LB. RAIL G.R.S. MODEL 4A

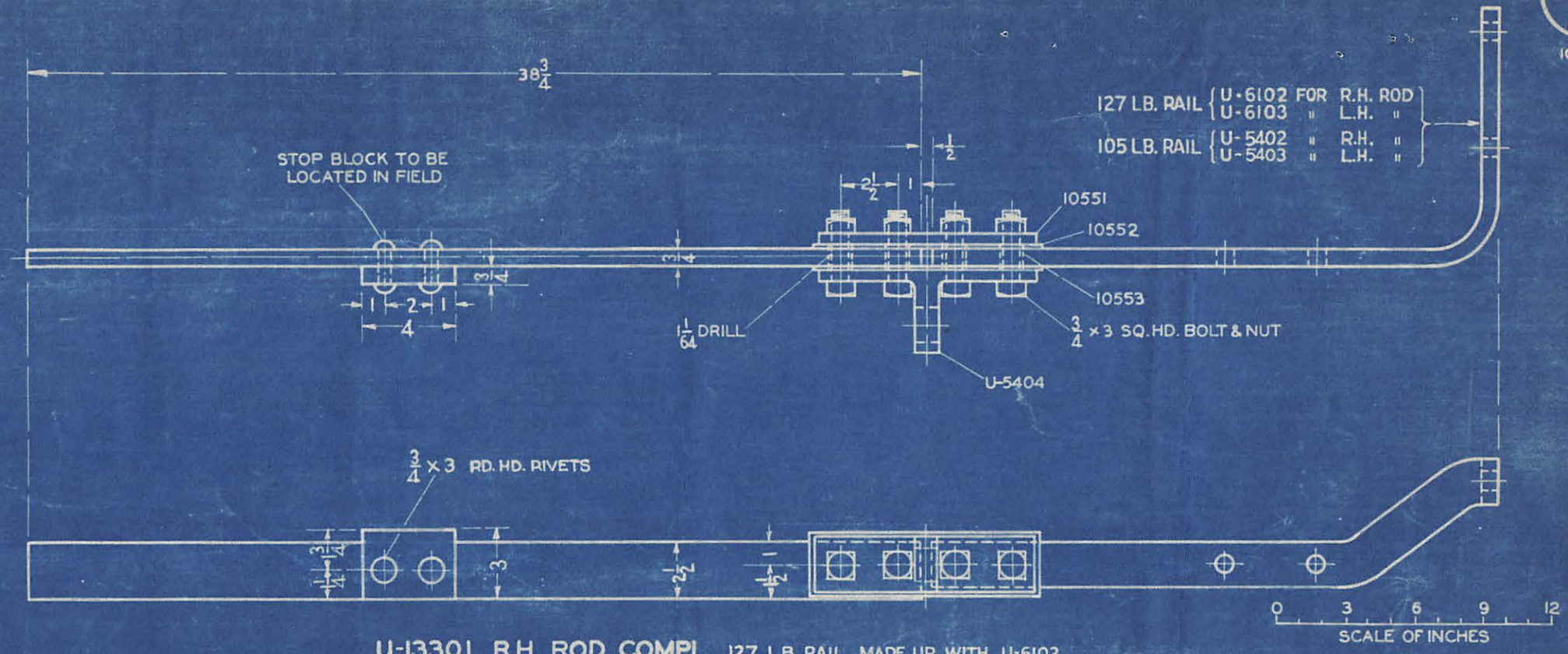
ALBANY MAR 10 1931

W. H. Elliott 3/20/31.
SIGNAL ENGR.

DEPT. 14
APR 15 1931
C. S. & S. CO.

U-133

10-13-31



127 LB. RAIL { U-6102 FOR R.H. ROD; U-6103 " L.H. " }

105 LB. RAIL { U-5402 " R.H. "; U-5403 " L.H. " }

U-13301 R.H. ROD COMPL., 127 LB. RAIL, MADE UP WITH U-6102.
U-13302 L.H. " " " " " " U-6103.
U-13303 R.H. " " 105 LB. " " " U-5402.
U-13304 L.H. " " " " " " U-5403.

FOR SPLIT POINT DERAIL

N. Y. C. R. R.

SIGNAL DEPT.-BUFFALO AND EAST

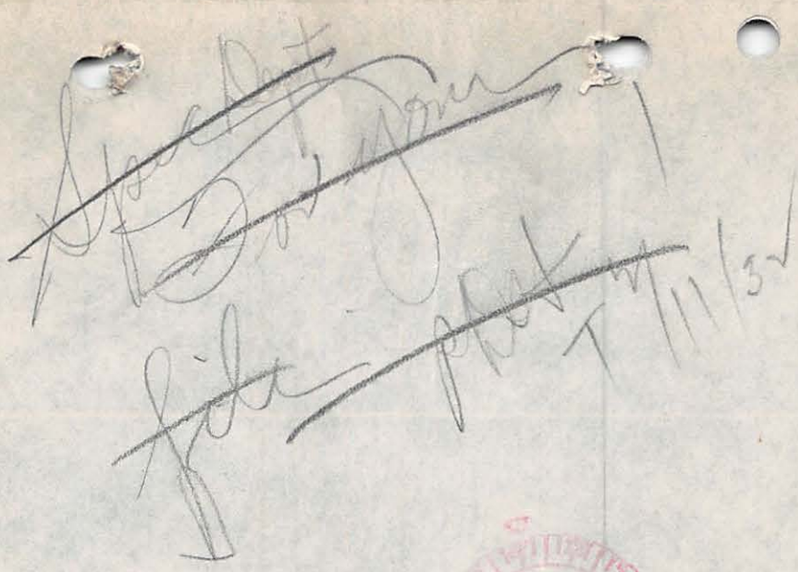
FRONT ROD

105 & 127 LB. RAIL

ALBANY OCT. 13, 1931.

W. H. Elliott 1/6/32.

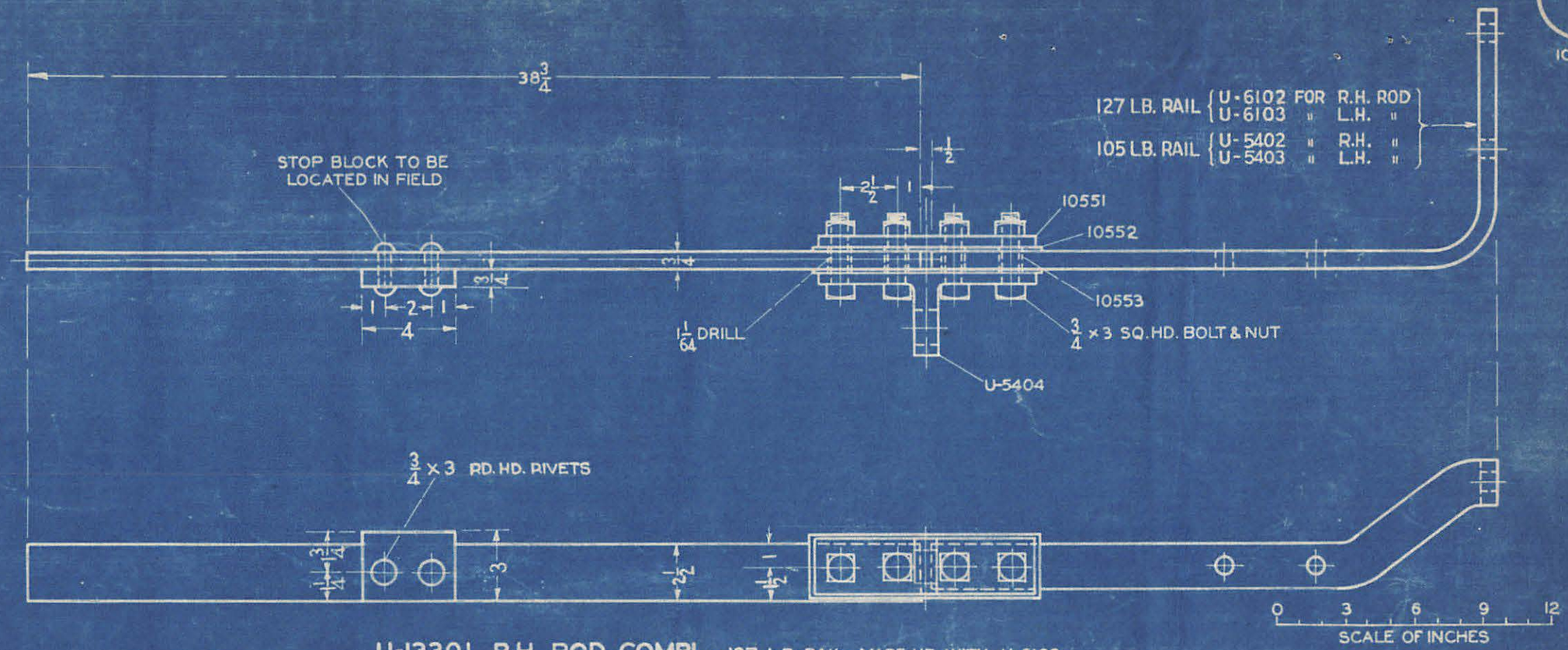
SIGNAL ENGR.



FEB
1932

U-133

10-13-31



U-13301 R.H. ROD COMPL., 127 LB. RAIL, MADE UP WITH U-6102.
U-13302 L.H. " " " " " " U-6103.
U-13303 R.H. " " 105 LB. " " " U-5402.
U-13304 L.H. " " " " " " U-5403.

FOR SPLIT POINT DERAIL

N. Y. C. R. R.

SIGNAL DEPT.-BUFFALO AND EAST

FRONT ROD

105 & 127 LB. RAIL

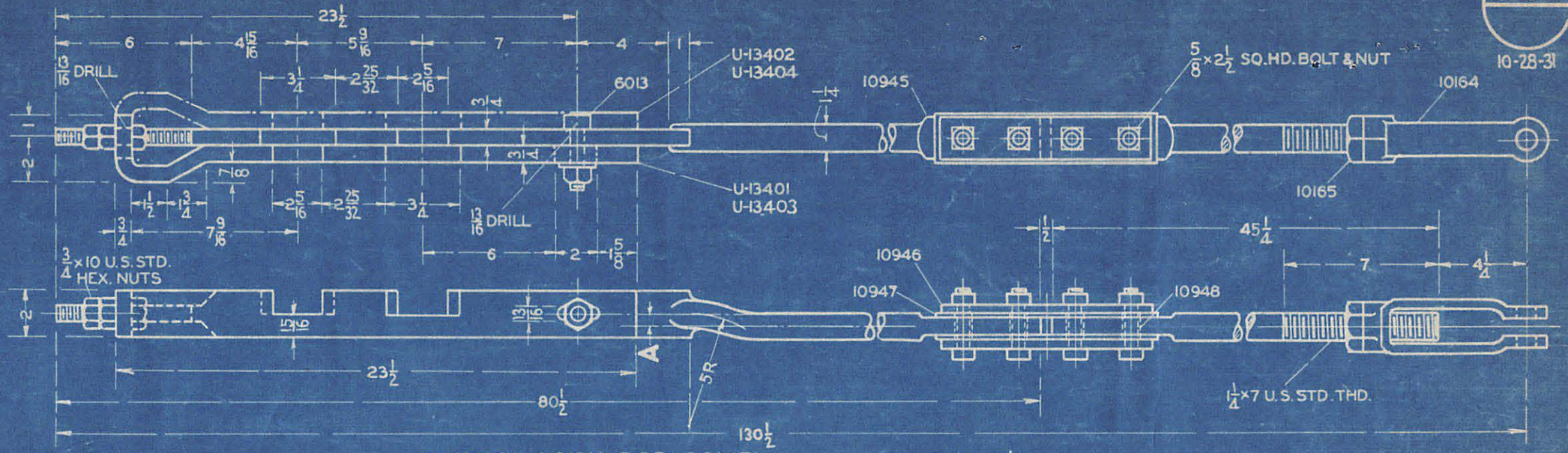
ALBANY OCT. 13, 1931.

W. H. Elliott 1/6/32.

SIGNAL ENGR.

U-134

10-28-31



U-13401	LOCK ROD COMPL.	105 LB. RAIL	R.H.	A	= ½
U-13402	" "	"	L.H.	A	= "
U-13403	" "	127 LB. RAIL	R.H.	A	= 1½
U-13404	" "	"	L.H.	A	= "

FOR HAYES DERAIL

O.H. STEEL

0 3 6 9 12

SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPT. - BUFFALO AND EAST

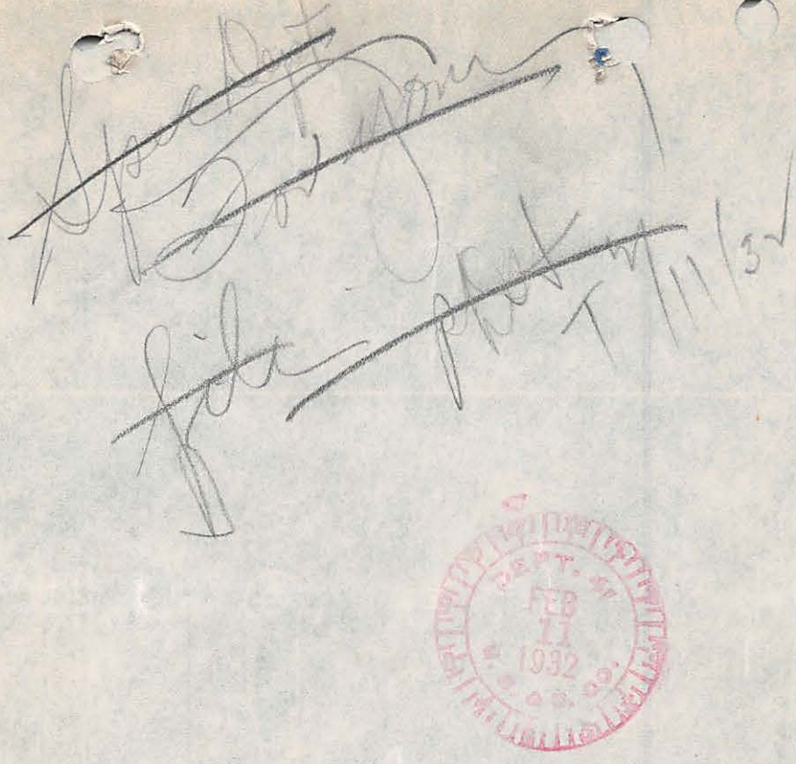
LOCK RODS

105 & 127 LB. RAIL G.R.S. MODEL 4A

ALBANY, OCT. 28, 1931.

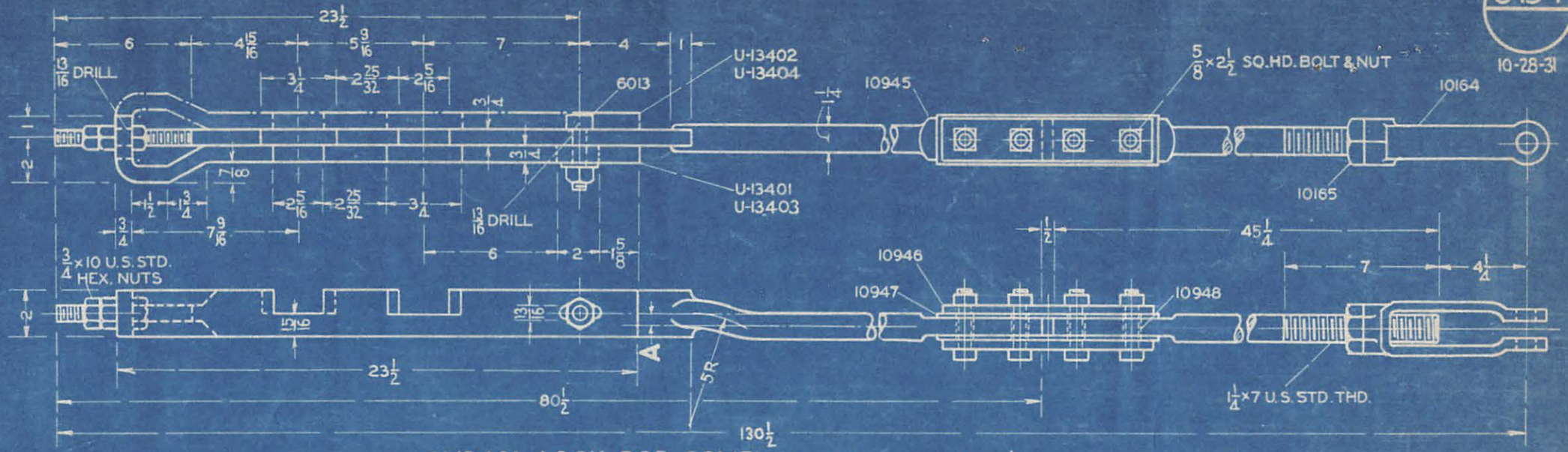
W. H. Elliott 11/6/32.

SIGNAL ENGR.


FEB
11
1932

U-134

10-28-31



U-13401	LOCK ROD COMPL.		105 LB. RAIL		R.H.	A = ½
U-13402	"	"	"	"	L.H.	A = "
U-13403	"	"	127 LB. RAIL		R.H.	A = 1½
U-13404	"	"	"	"	L.H.	A = "

FOR HAYES DERAIL

O. H. STEEL

0 3 6 9 12

SCALE OF INCHES

N. Y. C. R. R.

SIGNAL DEPT. - BUFFALO AND EAST

LOCK RODS

105 & 127 LB. RAIL G.R.S. MODEL 4A

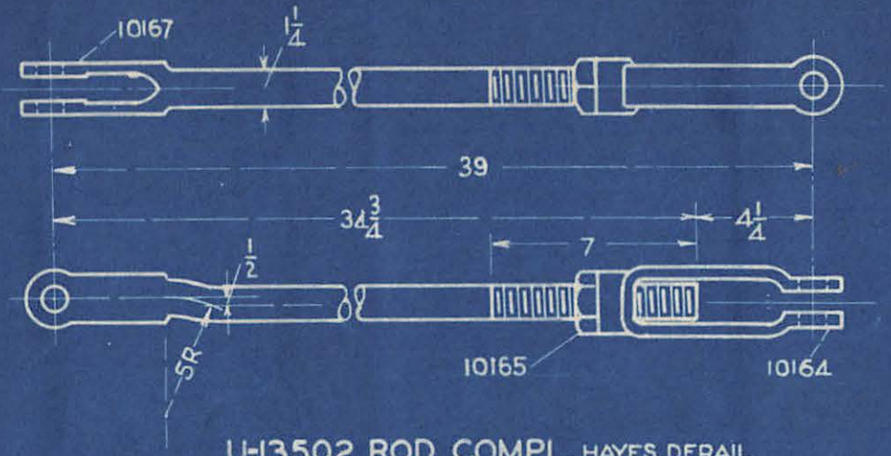
ALBANY, OCT. 28, 1931.

W. H. Elliott 11/6/32

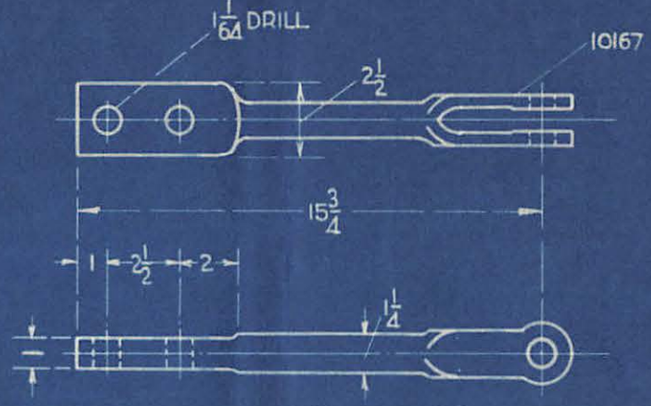
SIGNAL ENGR.

U-135

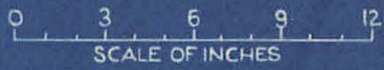
10-28-31



U-13502 ROD COMPL. HAYES DERAIL
O.H. STEEL



U-13501 SOLID JAW HALF ROD HAYES DERAIL
O.H. STEEL



N. Y. C. R. R.

SIGNAL DEPT. - BUFFALO AND EAST

DERAIL RODS

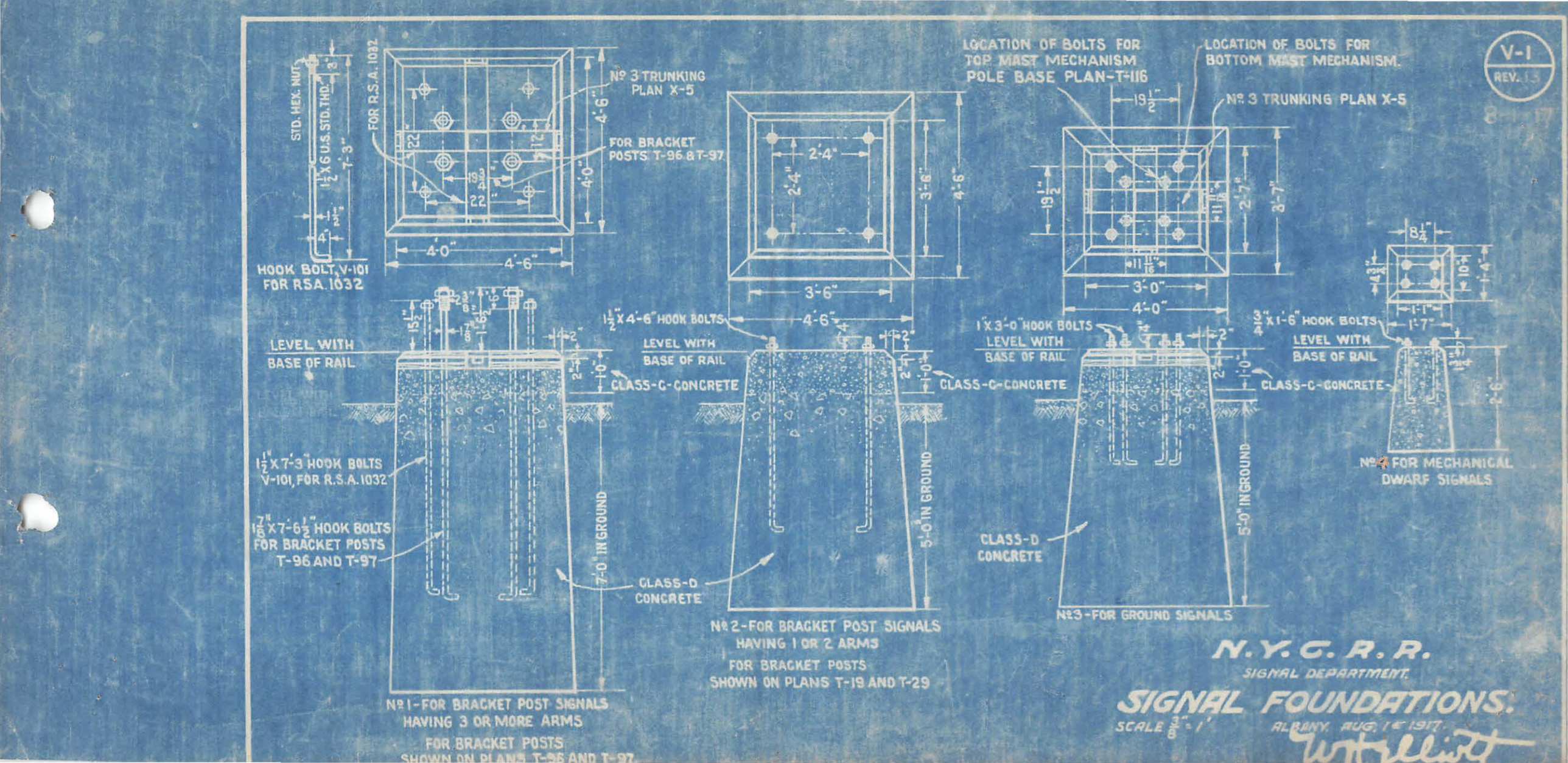
105 & 127 LB. RAIL G.R.S. MODEL 4A

ALBANY OCT. 28, 1931.

W. H. Elliott 11/4/32

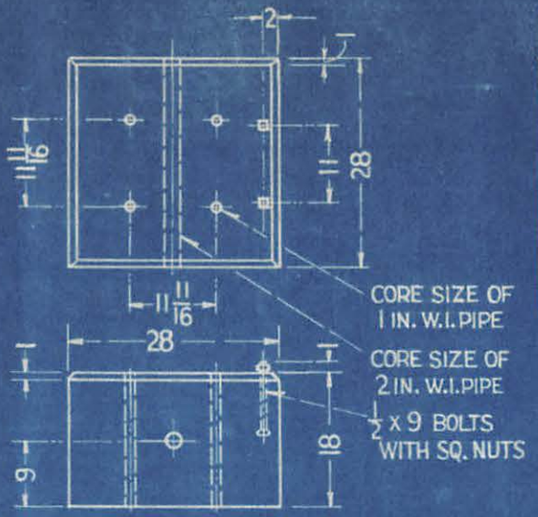
SIGNAL ENGR.

DEPT. OF
FEB
11
1932

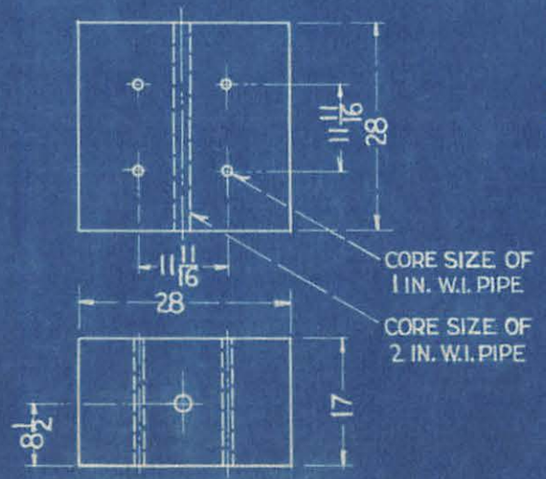

V-1
REV.
STD. HEX. NUT
1½" X 6 U.S. STD. THD.
2'-3"
7'-3"
4"
HOOK BOLT, V-101
FOR R.S.A. 1032
FOR R.S.A. 1032
№ 3 TRUNKING
PLAN X-5
FOR BRACKET
POSTS T-96 & T-97
4'-6"
4'-0"
4'-0"
4'-6"
LEVEL WITH
BASE OF RAIL
1½" X 7'-3" HOOK BOLTS
V-101, FOR R.S.A. 1032
1⅞" X 7'-6½" HOOK BOLTS
FOR BRACKET POSTS
T-96 AND T-97
7'-0" IN GROUND
CLASS-C-CONCRETE
CLASS-D
CONCRETE
№ 1 - FOR BRACKET POST SIGNALS
HAVING 3 OR MORE ARMS
FOR BRACKET POSTS
SHOWN ON PLANS T-96 AND T-97
2'-4"
2'-4"
3'-6"
4'-6"
3'-6"
4'-6"
1½" X 4'-6" HOOK BOLTS
LEVEL WITH
BASE OF RAIL
CLASS-C-CONCRETE
5'-0" IN GROUND
№ 2 - FOR BRACKET POST SIGNALS
HAVING 1 OR 2 ARMS
FOR BRACKET POSTS
SHOWN ON PLANS T-19 AND T-29
LOCATION OF BOLTS FOR
TOP MAST MECHANISM
POLE BASE PLAN-T-116
LOCATION OF BOLTS FOR
BOTTOM MAST MECHANISM.
№ 3 TRUNKING PLAN X-5
19½"
19½"
3'-0"
4'-0"
1" X 3'-0" HOOK BOLTS
LEVEL WITH
BASE OF RAIL
CLASS-C-CONCRETE
CLASS-D
CONCRETE
5'-0" IN GROUND
№ 3 - FOR GROUND SIGNALS
8¼"
10½"
1'-1"
1'-7"
¾" X 1'-6" HOOK BOLTS
LEVEL WITH
BASE OF RAIL
CLASS-C-CONCRETE
№ 4 FOR MECHANICAL
DWARF SIGNALS
N.Y.C.R.R.
SIGNAL DEPARTMENT.
SIGNAL FOUNDATIONS.
SCALE 3" = 1'
ALBANY, AUG. 1st 1917.

V-3

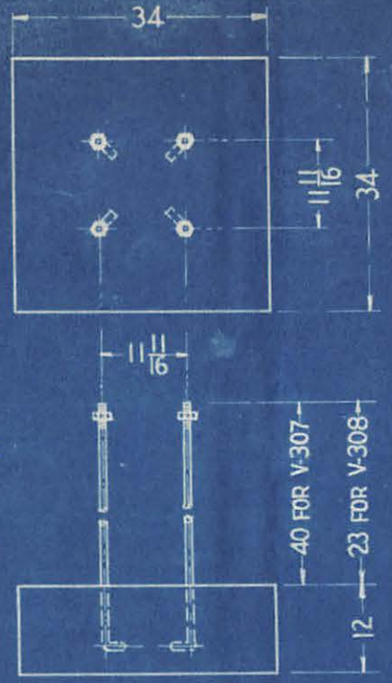
11-23-31



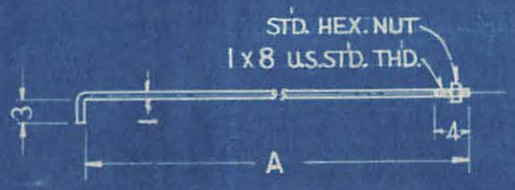
V-303, TOP BLOCK.
CLASS 'C' CONCRETE, PLAN Z-40.



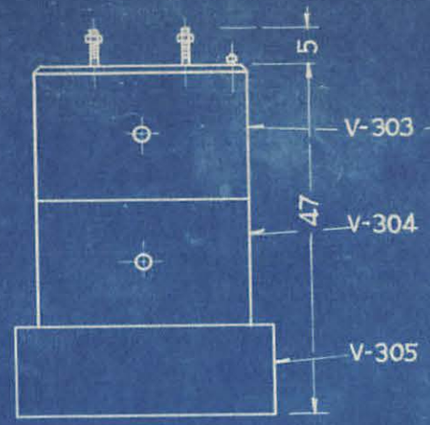
V-304, INTERMEDIATE BLOCK.
CLASS 'D' CONCRETE, PLAN Z-40.



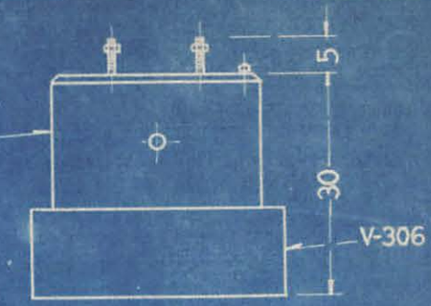
V-305, BASE, WITH V-307.
V-306, " " V-308.
CLASS 'D' CONCRETE, PLAN Z-40.



V-307, ANCHOR BOLT A = 48
V-308, " " A = 31
O.H. STEEL.



V-301, ASSEMBLY.



V-302, ASSEMBLY.

NOTE: BOLT HOLES SHALL BE FILLED WITH A THIN MIXTURE OF ONE PART CEMENT TO ONE AND ONE HALF PARTS SAND, AFTER BOLTS ARE IN PLACE.

0 6 12 24 36 48
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.
SIGNAL DEPT. – BUFFALO AND EAST

PRE-CAST FOUNDATION
HIGHWAY CROSSING SIGNAL

ALBANY, NOV. 23, 1931.

W. H. Ellis 11/27/31
SIGNAL ENGR.

DEC 3 1931
A. M.
NOTE
ATTENTION
Ans'd
Date

Dept. 41
DEC 3
1931
U. S. S.

V-11
REV. 2

2-12-11

NOTE:- CENTER OF NEAREST PIPE TO BE LOCATED 4'-3" FROM GAUGE LINE OF NEAREST RAIL UNLESS OTHERWISE ALLOWED BY ENGINEER.

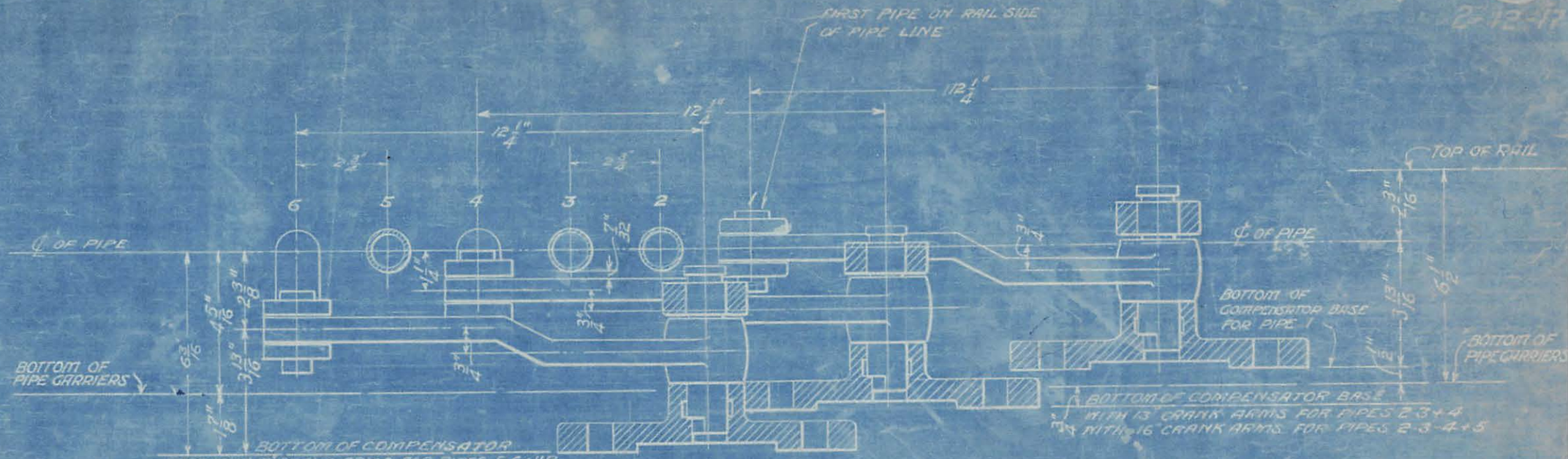

FIRST PIPE ON RAIL SIDE OF PIPE LINE
12 1/4"
12 1/4"
112 1/4"
2 3/8"
2 3/8"
6
5
4
3
2
℄ OF PIPE
℄ OF PIPE
TOP OF RAIL
BOTTOM OF PIPE CARRIERS
BOTTOM OF PIPE CARRIERS
BOTTOM OF COMPENSATOR BASE FOR PIPE 1
BOTTOM OF COMPENSATOR BASE WITH 13" CRANK ARMS FOR PIPES 2-3-4 WITH 16" CRANK ARMS FOR PIPES 2-3-4-5
BOTTOM OF COMPENSATOR BASE WITH 13" CRANK ARMS FOR PIPES 5-6 & UP WITH 16" CRANK ARMS FOR PIPES 6 & UP

TABLE FOR COMPENSATORS WITH 13" CRANK ARMS
PIPES ARE NUMBERED FROM RAIL SIDE OF PIPE LINE

NO. OF PIPE	OFF-SET OF JAW	BOTTOM OF COMP. BASE FROM CENTER OF PIPE	BOTTOM OF COMP. BASE FROM BOTTOM OF PIPE CARRIER
1	0"	3 13/16"	1/2" ABOVE P.C.
2	1 1/4"	5 1/16"	3/4" BELOW P.C.
3	1 1/4"	5 1/16"	3/4" "
4	1 1/4"	5 1/16"	3/4" "
5 & UP	2 3/8"	6 3/16"	1 1/8" "

NOTE:- FOR 13" COMPENSATOR ARMS THE DISTANCE FROM CENTER OF PIPE TO CENTER OF COMPENSATOR IS 12 1/4" FOR 16" ARMS ABOVE DISTANCE IS 15 3/8"

NOTE:- PLAN SHOWS ELEVATION OF COMPENSATORS WHEN PIPE LINE IS LOCATED OUTSIDE OF TRACKS. NO TWO WAY COMPENSATORS ARE TO BE USED. COMPENSATORS SHALL BE LOCATED ON TRACK SIDE OF PIPE.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

COMPENSATOR LOCATION.

SCALE 3" = 1' NEW YORK OCT. 23-08

W.H. Elliott, 11/17/08.

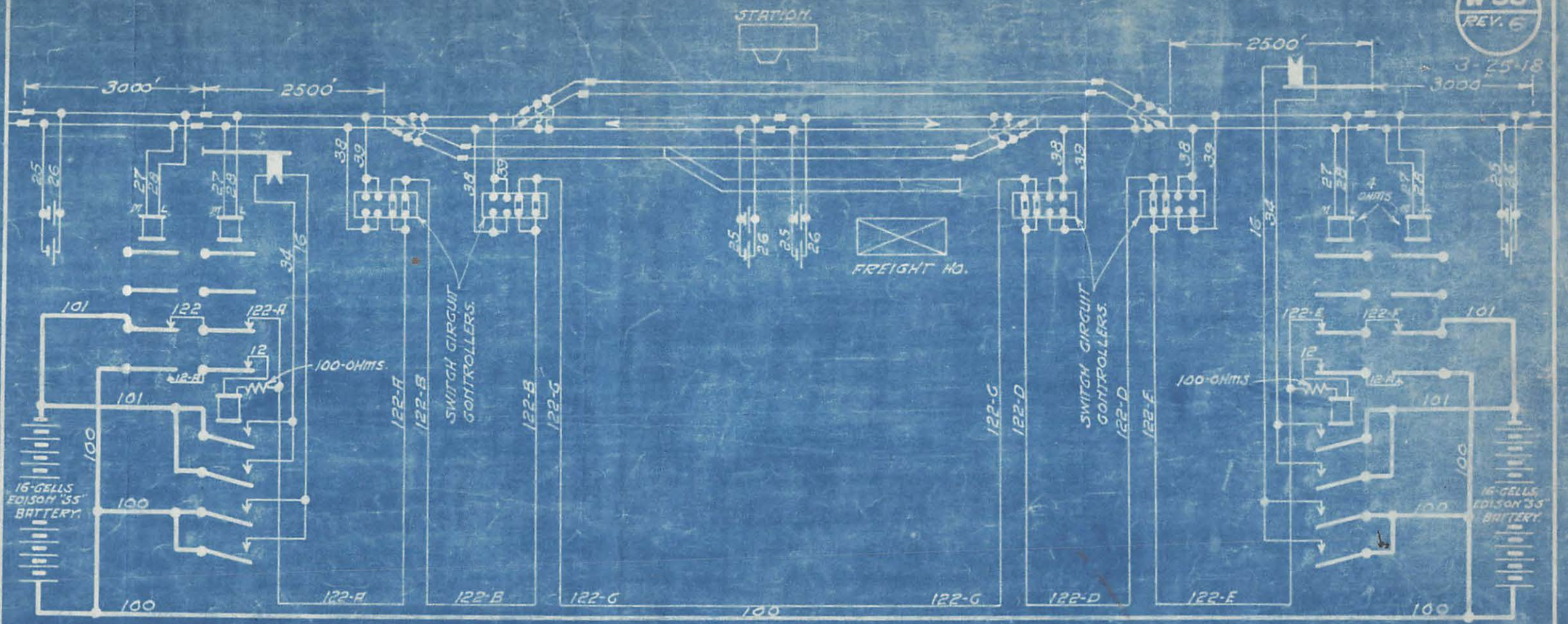
SIG. ENGR

RECEIVED
FEB
26
1917
DEPT.

RECD
FEB
26
1917

W-58
REV. 6

3-25-18



NOTE:-
TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT. FOR CINDER, 3500 FT. FOR GRAVEL AND 4000 FT. FOR ROCK BALLASTED TRACK.
WHERE A DISTANT SWITCH SIGNAL IS TO BE USED AS A DISTANT SIGNAL FOR A MANUAL BLOCK SIGNAL, LINE WIRE CIRCUITS MUST BE INSTALLED BETWEEN THE OFFICE AND SIGNAL AND A CIRCUIT CONTROLLER MUST BE PLACED ON THE MANUAL BLOCK SIGNAL.
SWITCH CIRCUIT CONTROLLERS, WHERE REQUIRED, SHALL BE CONNECTED TO NORMALLY CLOSED SIDE OF SWITCH AND ARRANGED SO THAT THE MOVEMENT OF THE SWITCH WILL MECHANICALLY OPEN CONTACTS OF LINE CIRCUIT TO SIGNAL.
SEE CIRCUIT PLAN SPECIFICATIONS Z-39, Z-52, Z-53 & Z-54.

N.Y.C.R.R.
SIGNAL DEPT.

SWITCH SIGNAL CIRCUITS.

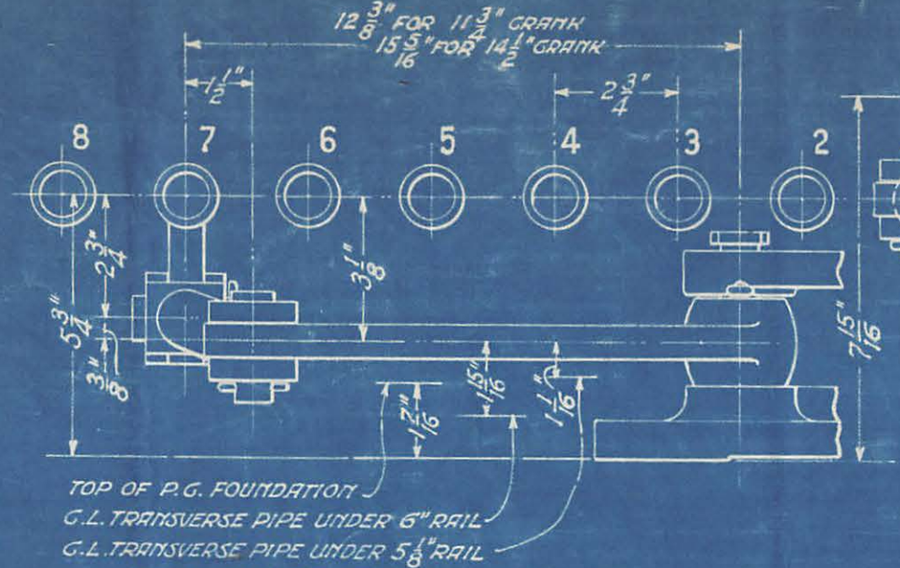
CAUTIONARY BLOCKING IN BOTH DIRECTIONS.
NEW YORK - DEC. 15-1908.

W.H. Elliott
SIGNAL ENGINEER.

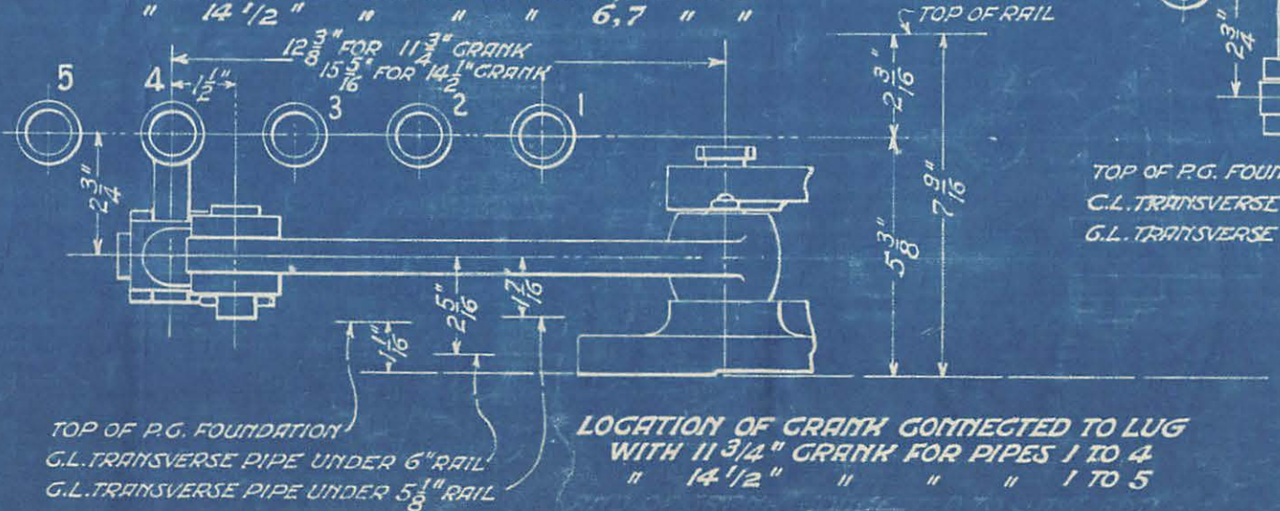
R.L.S.
S.A.W.
K.M.
A.W.

APR 16 1918

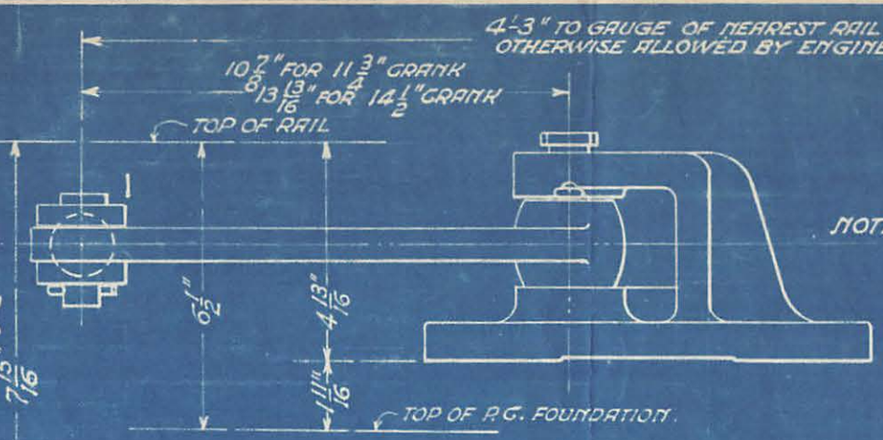
V-13
REV. 1
10-9-17



LOCATION OF CRANK CONNECTED TO LUG
WITH 11 3/4" CRANK FOR PIPES 5, 6 AND UP
" 14 1/2" " " " 6, 7 " "

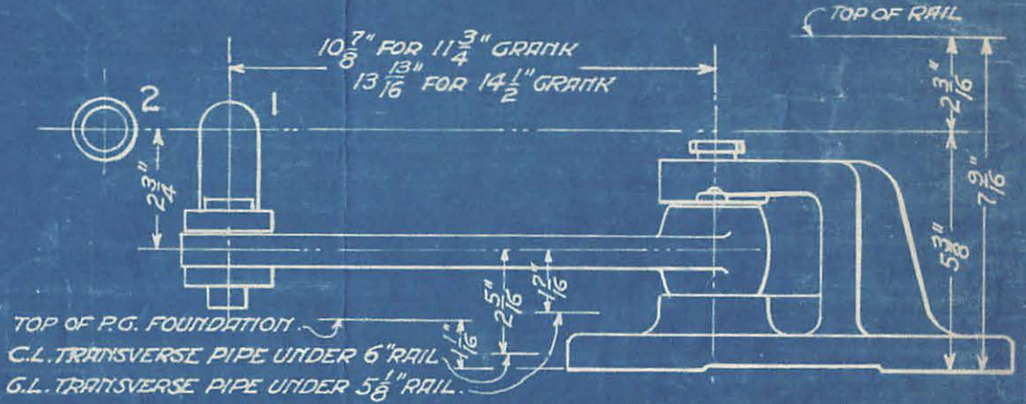


LOCATION OF CRANK CONNECTED TO LUG
WITH 11 3/4" CRANK FOR PIPES 1 TO 4
" 14 1/2" " " " 1 TO 5


4'-3" TO GAUGE OF NEAREST RAIL UNLESS OTHERWISE ALLOWED BY ENGINEER.
10 7/8" FOR 11 3/4" CRANK
13 13/16" FOR 14 1/2" CRANK
TOP OF RAIL
1
6 1/2"
4 13/16"
1 11/16"
TOP OF P.G. FOUNDATION

LOCATION OF CRANK NOT OTHERWISE SPECIFIED.

NOTE: PLAN SHOWS ELEVATION OF CRANK STANDS WHEN PIPE LINE IS LOCATED OUTSIDE OF TRACKS.



LOCATION OF CRANK CONNECTED TO JAW
AND TO CROSS CONNECTION UNDER TRACKS
WITH 11 3/4" CRANK FOR PIPES 1 TO 4
" 14 1/2" " " " 1 TO 5

N. Y. C. R. R.

SIGNAL DEPT.

CRANK STAND LOCATION.

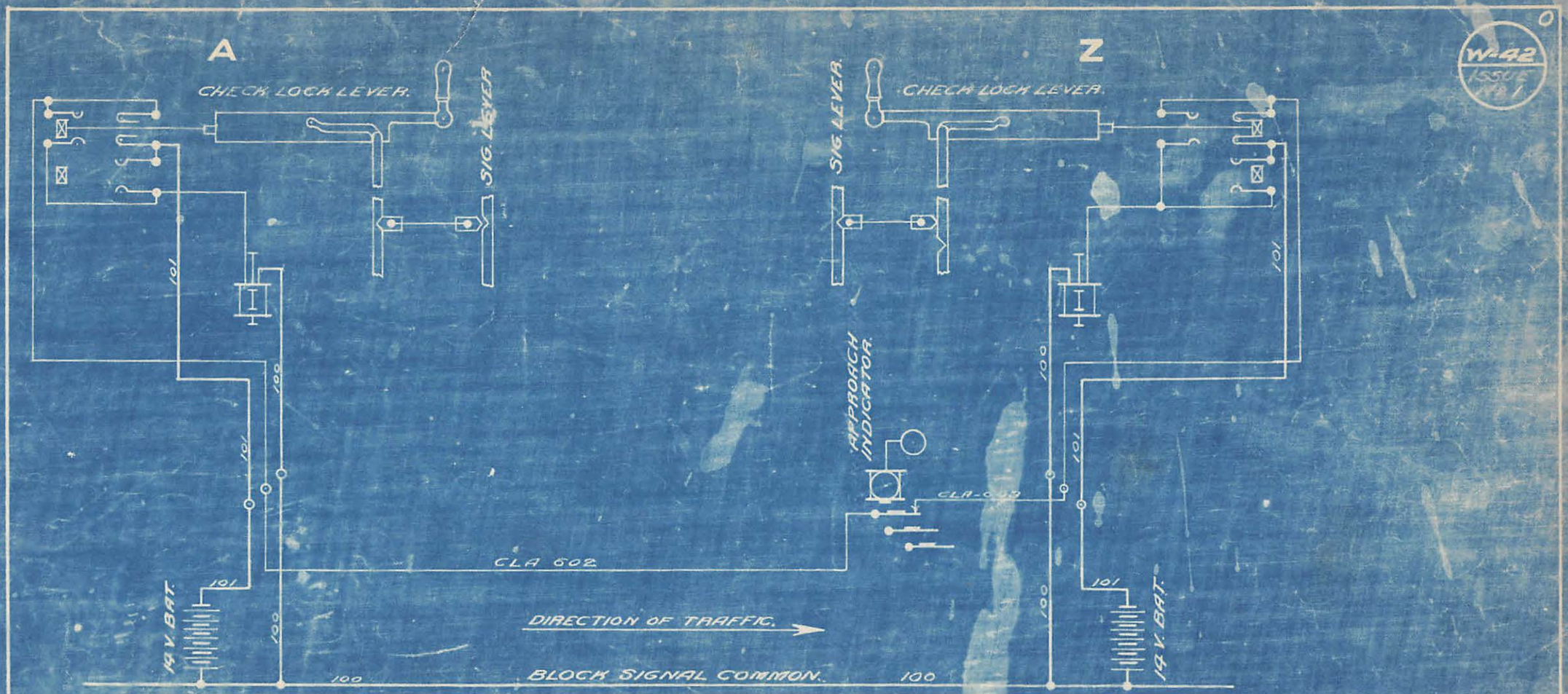
SCALE: 3" = 1'-0". ALBANY, OCT. 9TH, 1917.

W. H. Elliott 10/10/17

SIGNAL ENGINEER.

THE U. S. & S. CO.
MAILING DEPT.

OCT 23 1917



W-42
ISSUE
1911

N. Y. C. & H. R. R. R.

SIGNAL DEP'T. - EXTERIOR ZONE.

CHECK LOCKING CIRCUITS.

FOR USE WITH GEN. ... SIG. CO.'S ELECTRIC MACHINE.

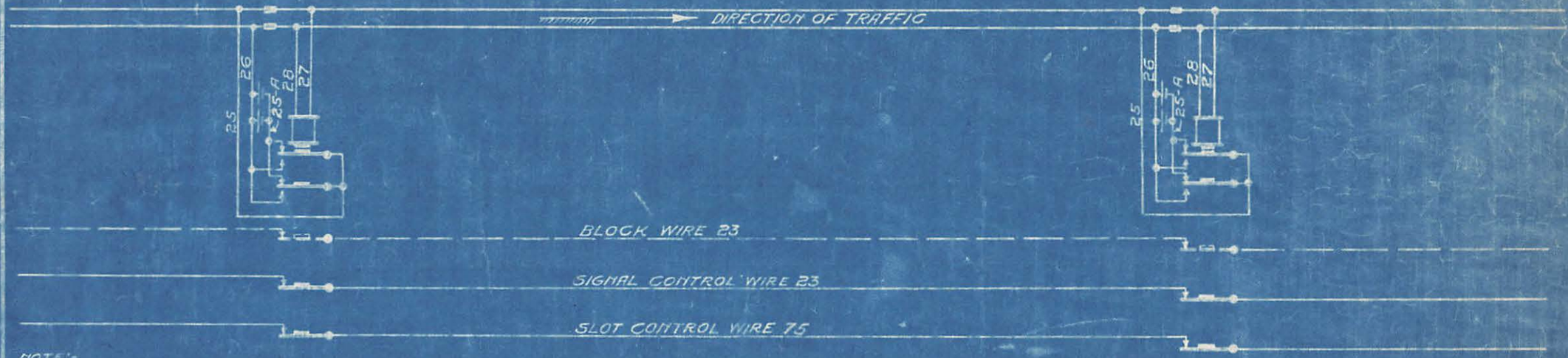
NO SCALE - NEW YORK - 2-13-'08. - J.O.'B.

STANDARD PLAN.

W. H. Elliot
SIGNAL ENGINEER.

O. S. Lovell
ASS'T. GEN. MANAGER.

W-53
REV-1
10-10-11



NOTE:-
AT INTERLOCKINGS THE SLOT OR 75 WIRES MUST BE CONTROLLED THROUGH ALL CUT SECTION RELAYS TO THE NEXT HOME OR AUTOMATIC SIGNAL IN ADVANCE ON THE TRACK GOVERNED BY SUCH SLOTTED SIGNAL.
THE CONTROL OR 23 WIRES FOR POWER OPERATED HOME OR AUTOMATIC SIGNALS MUST BE CONTROLLED THROUGH ALL CUT-SECTION RELAYS TO THE NEXT HOME OR AUTOMATIC SIGNAL IN ADVANCE ON THE TRACK GOVERNED BY SUCH SIGNAL.
WHERE LOCK AND BLOCK SYSTEM IS IN SERVICE AND SEPARATE LINE WIRE IS USED FOR BLOCK WIRE 23, AND SHORT LOCKING UP CIRCUIT IN ADVANCE OF BLOCK SIGNAL IS NOT USED, BLOCK WIRE 23 MUST BE CONTROLLED THROUGH ALL CUT SECTION RELAYS TO THE HOME SIGNAL AT THE TOWER IN ADVANCE.

N.Y.C.&H.R.R.R.

SIGNAL DEPARTMENT

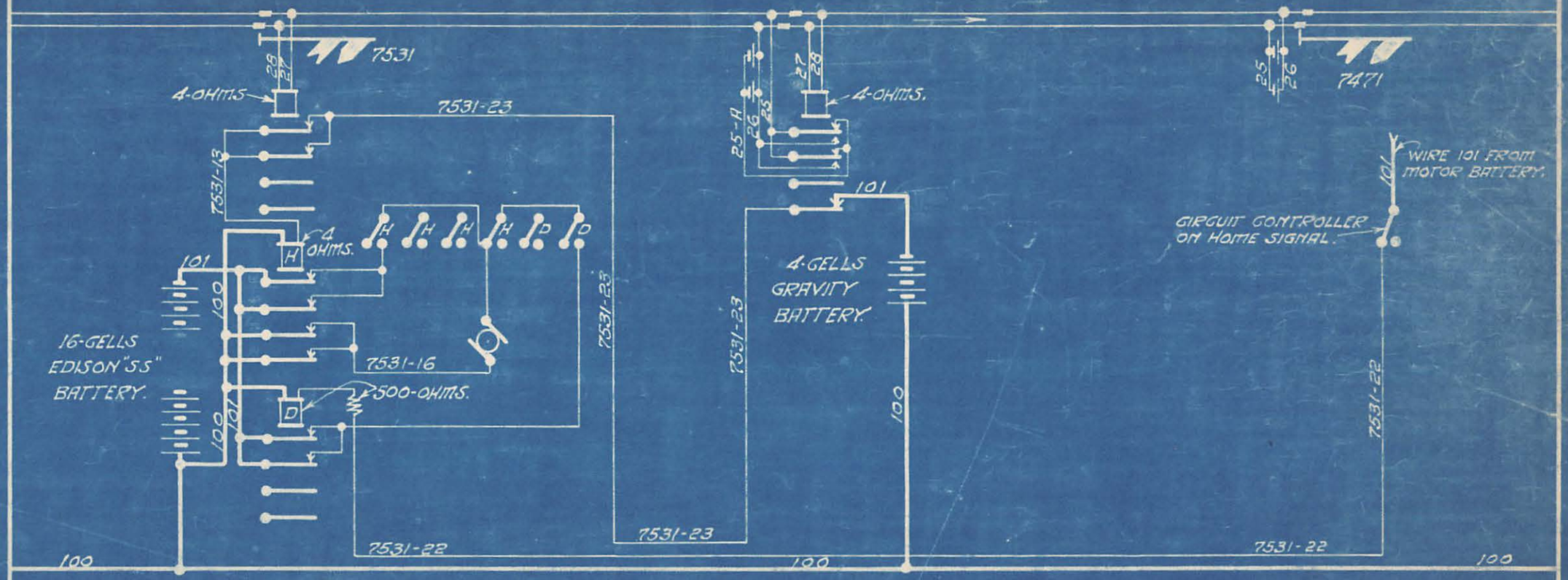
LINE WIRE CONTROL THROUGH CUT SECTION RELAYS.

ALBANY. OCT. 10, 1911.

W.H. Elliott 10/10/11.

SIGNAL ENGINEER.

W-56
REV. 3



NOTE:-
TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT. FOR GRAVEL AND 3500 FT. FOR ROCK BALLASTED TRACK.

N. Y. C. & H. R. R. R.

SIGNAL DEP'T.

NORMAL CLEAR AUTOMATIC SIGNALS.

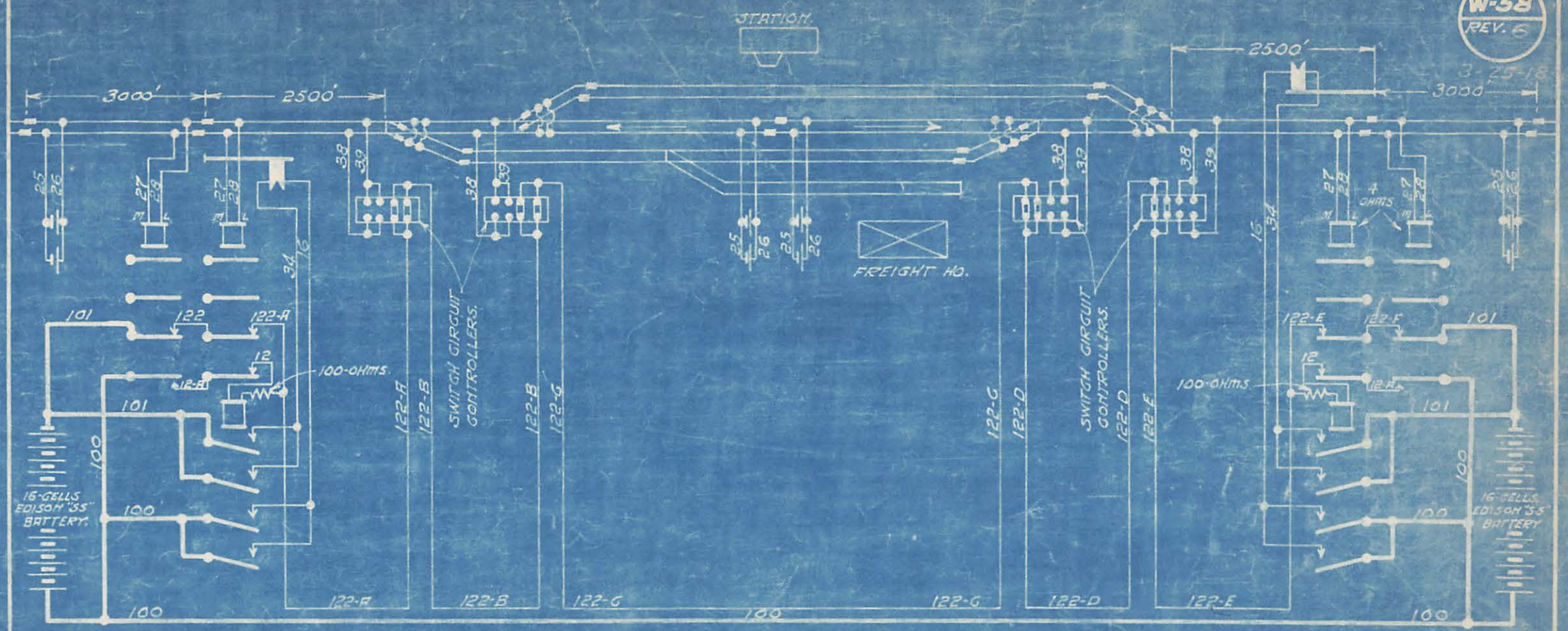
TYPICAL CIRCUITS.

NEW YORK, NOV. 18 08.

W. H. Elliott 4/13/10.

SIGNAL ENGINEER.

W-58
REV. 6



NOTE:-
TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT. FOR CINDER, 3500 FT. FOR GRAVEL AND 4000 FT. FOR ROCK BALLASTED TRACK.
WHERE A DISTANT SWITCH SIGNAL IS TO BE USED AS A DISTANT SIGNAL FOR A MANUAL BLOCK SIGNAL, LINE WIRE CIRCUITS MUST BE INSTALLED BETWEEN THE OFFICE AND SIGNAL AND A CIRCUIT CONTROLLER MUST BE PLACED ON THE MANUAL BLOCK SIGNAL.
SWITCH CIRCUIT CONTROLLERS, WHERE REQUIRED, SHALL BE CONNECTED TO NORMALLY CLOSED SIDE OF SWITCH AND ARRANGED SO THAT THE MOVEMENT OF THE SWITCH WILL MECHANICALLY OPEN CONTACTS OF LINE CIRCUIT TO SIGNAL.
SEE CIRCUIT PLAN SPECIFICATIONS Z-50, Z-52, Z-53 & Z-54.

N.Y.C.R.R.
SIGNAL DEPT.

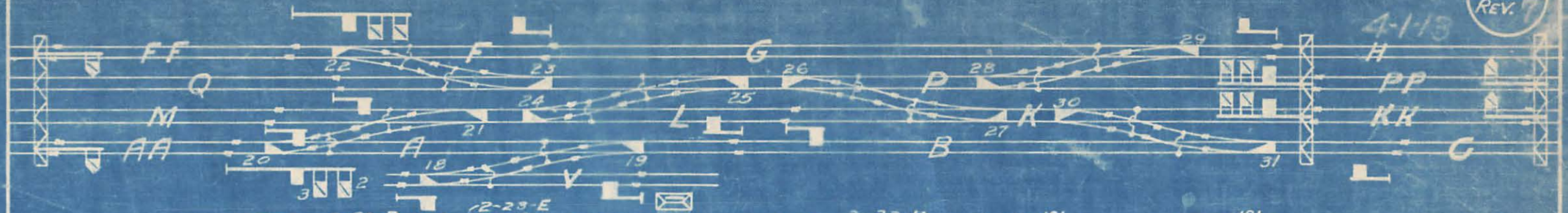
SWITCH SIGNAL CIRCUITS.

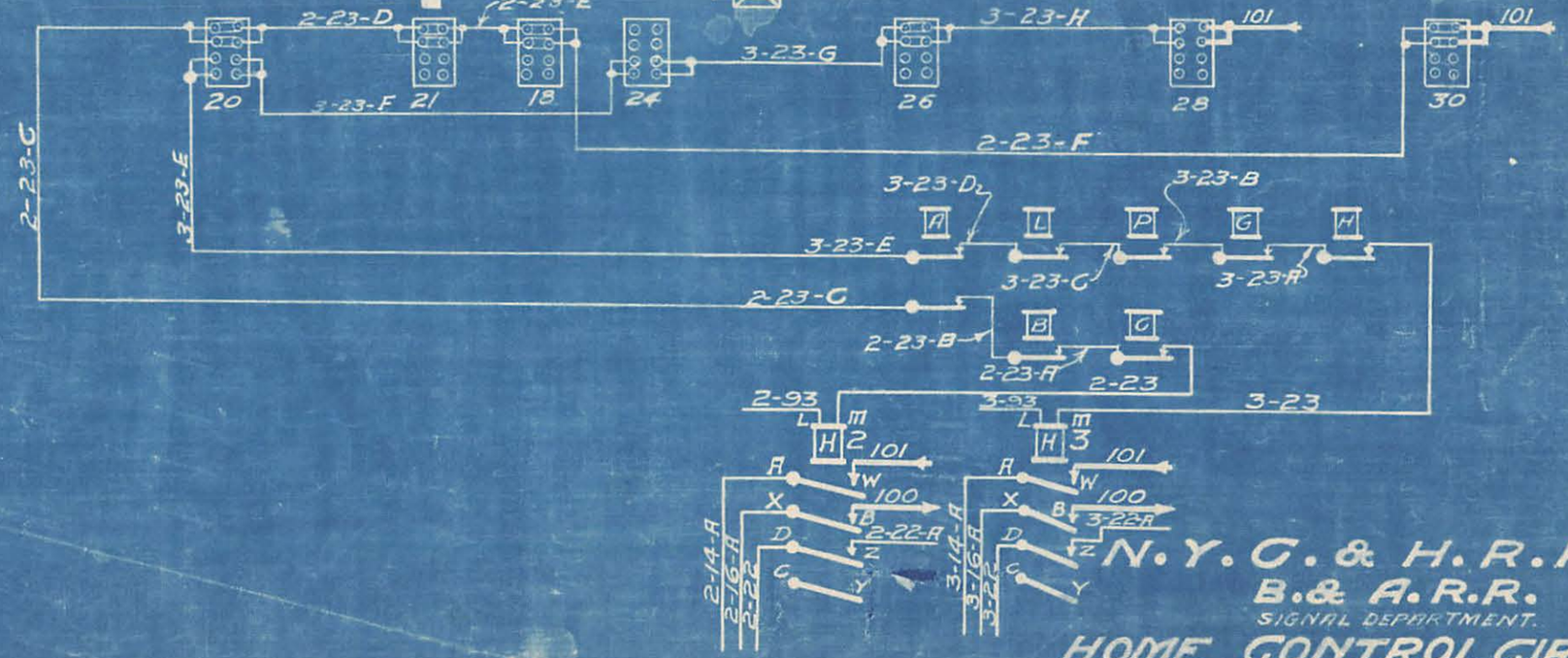
CAUTIONARY BLOCKING IN BOTH DIRECTIONS.
NEW YORK - DEC. 15-1908.

W. H. Elliott
SIGNAL ENGINEER.

W-64
REV. 7

4-1-13





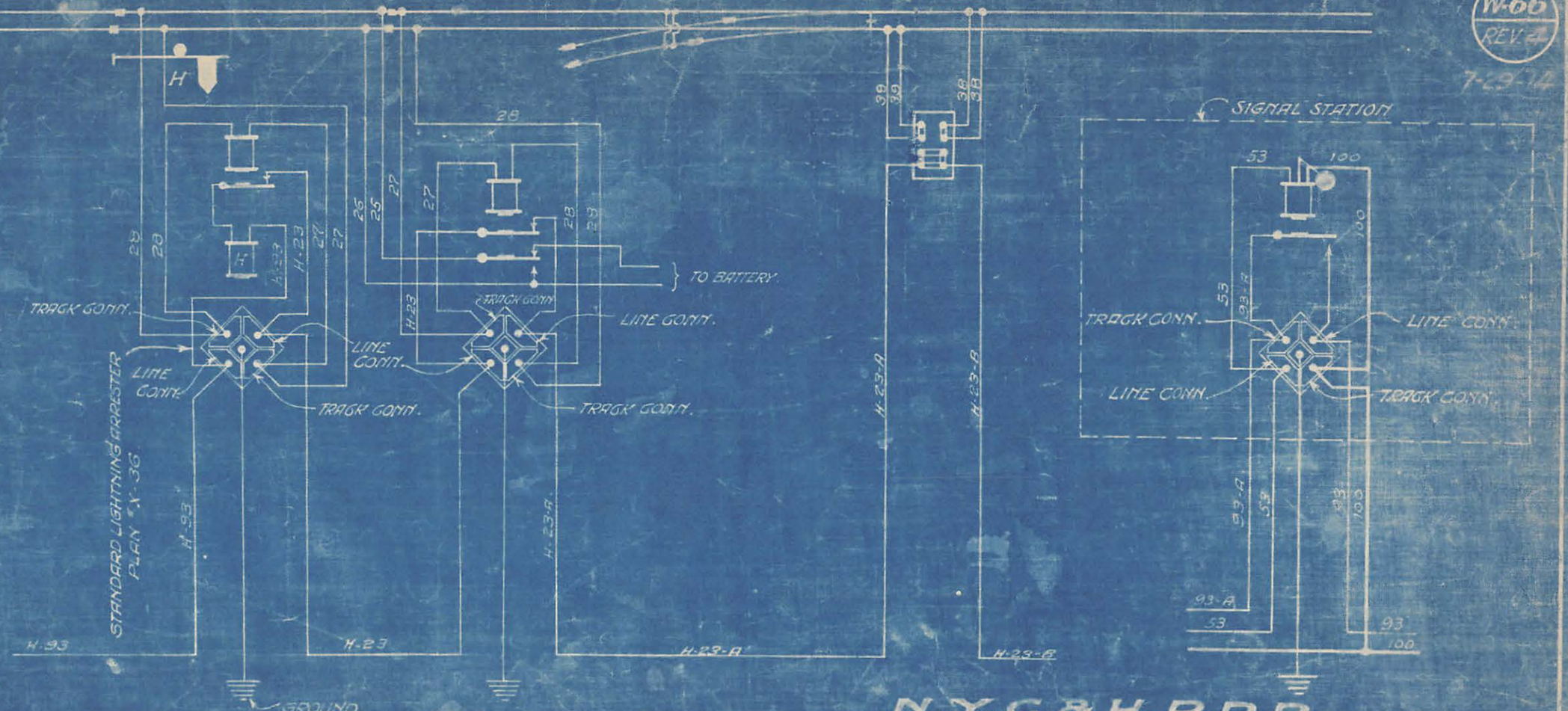
N. Y. C. & H. R. R. R.
B. & A. R. R.
SIGNAL DEPARTMENT.

HOME CONTROL CIRCUITS FOR INTERLOCKING POWER SIGNALS

ALBANY MARCH 11, 1910.

W. H. Elliott 4/23/10.
SIGNAL ENGINEER.

W-66
REV. 2
7-29-14



NOTE: BRASS POINTS OF LIGHTNING ARRESTER MAY BE USED FOR LINE CONNECTIONS WHERE CARBORUNDUM POINTS ARE NOT AVAILABLE. CARBORUNDUM POINTS SHALL BE USED FOR LINE CONNECTIONS AS FAR AS PRACTICABLE.
WHERE ALL POINTS OF A LIGHTNING ARRESTER ARE USED FOR EITHER TRACK OR LINE CONNECTIONS THEY SHALL BE ARRANGED SO THAT ALL WIRES FOR EACH TRACK WILL BE ATTACHED TO THE SAME ARRESTER OR GROUP OF ARRESTERS.

N.Y.C.& H.R.R.

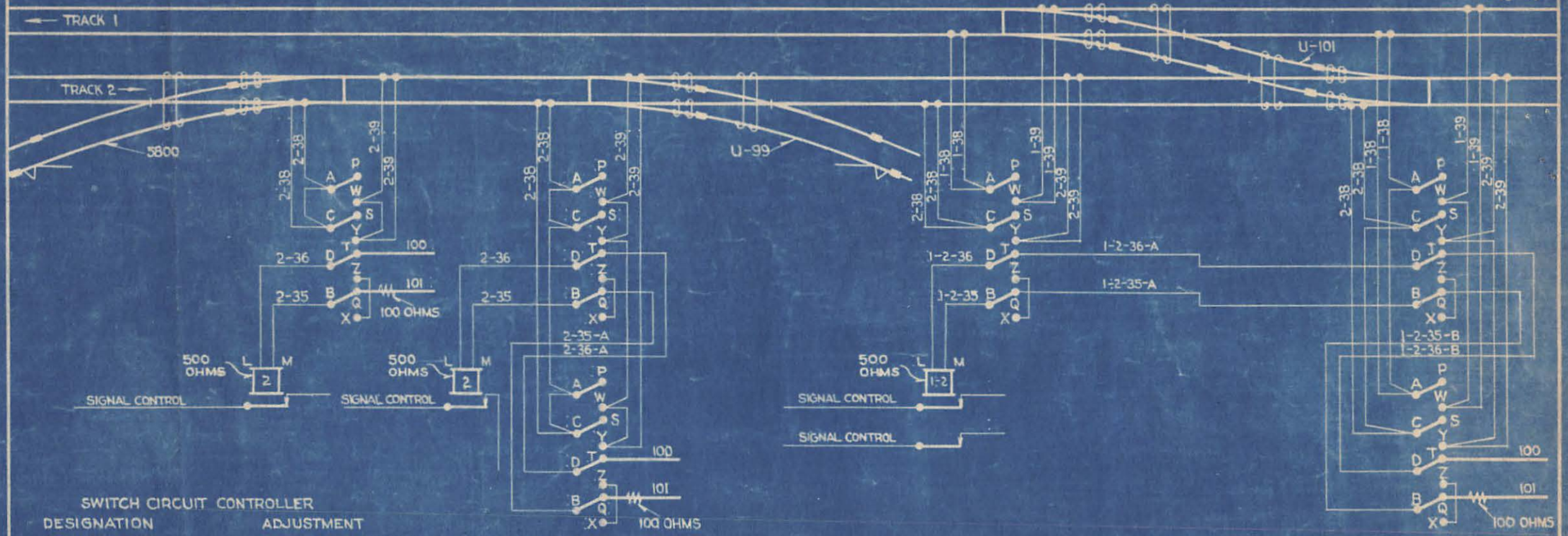
SIGNAL DEPT. EXTERIOR ZONE.

LIGHTNING ARRESTER CONNECTIONS.

NEW YORK, APRIL 2 - 1909.

Elliott 4/1/09.
SIGNAL ENGINEER.

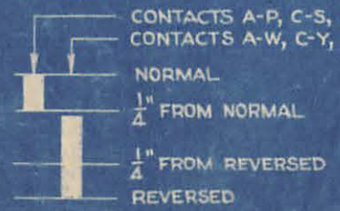
W-69
REV.
3
2-18-29.



SWITCH CIRCUIT CONTROLLER

DESIGNATION

ADJUSTMENT



NOTE: WHEN H.S.& S.CO'S. STYLE G-2. CIRCUIT CONTROLLER IS USED, WITH SWITCH NORMAL, PLACE ROLLER IN SLOT ON ALL CONTACTS.
ALL ROLLERS SHALL BE ON THE QUADRANT WHEN SWITCH IS MOVING BETWEEN NORMAL AND REVERSED.

N. Y. C. R. R.

SIGNAL DEPARTMENT

OUTLYING SWITCH RELAY CONTROL

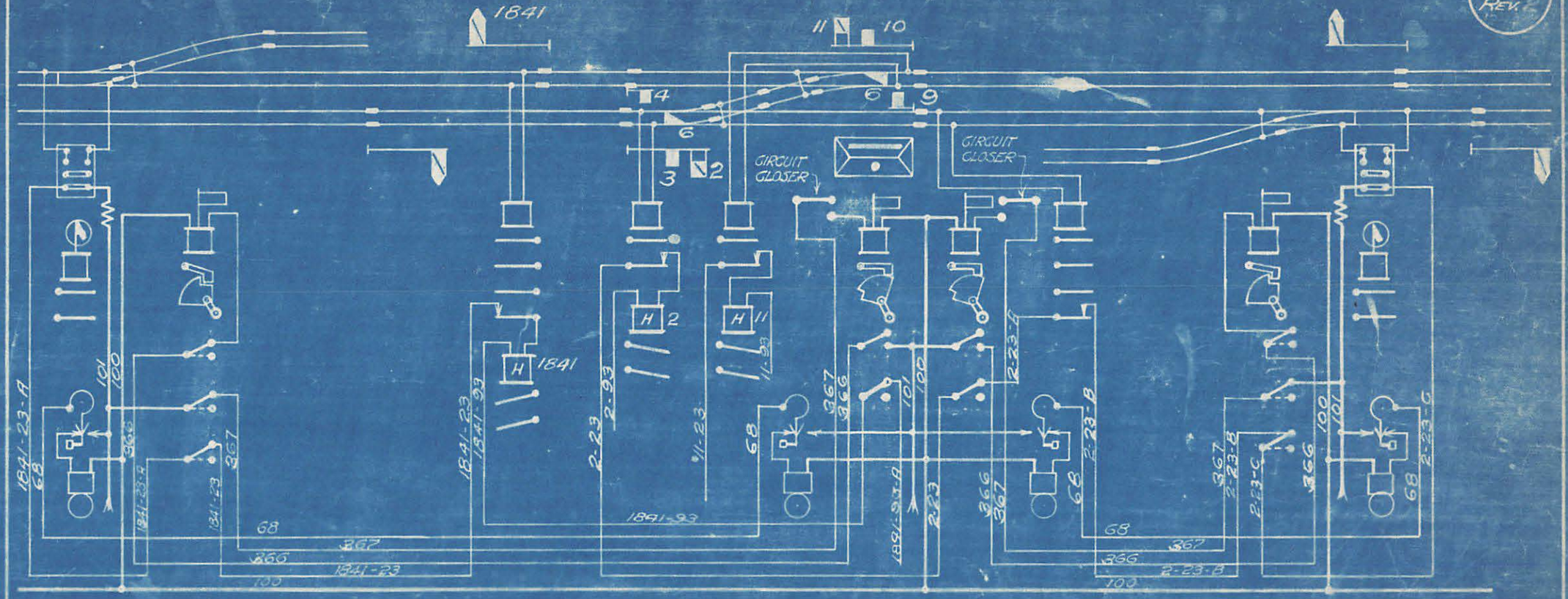
ALBANY JULY 16 1923

W.H. Elliott 12/28/28

SIGNAL ENGR

DEPT. 41
MAR
4
1929
U. S. S. & S. CO.

W-70
REV. 2

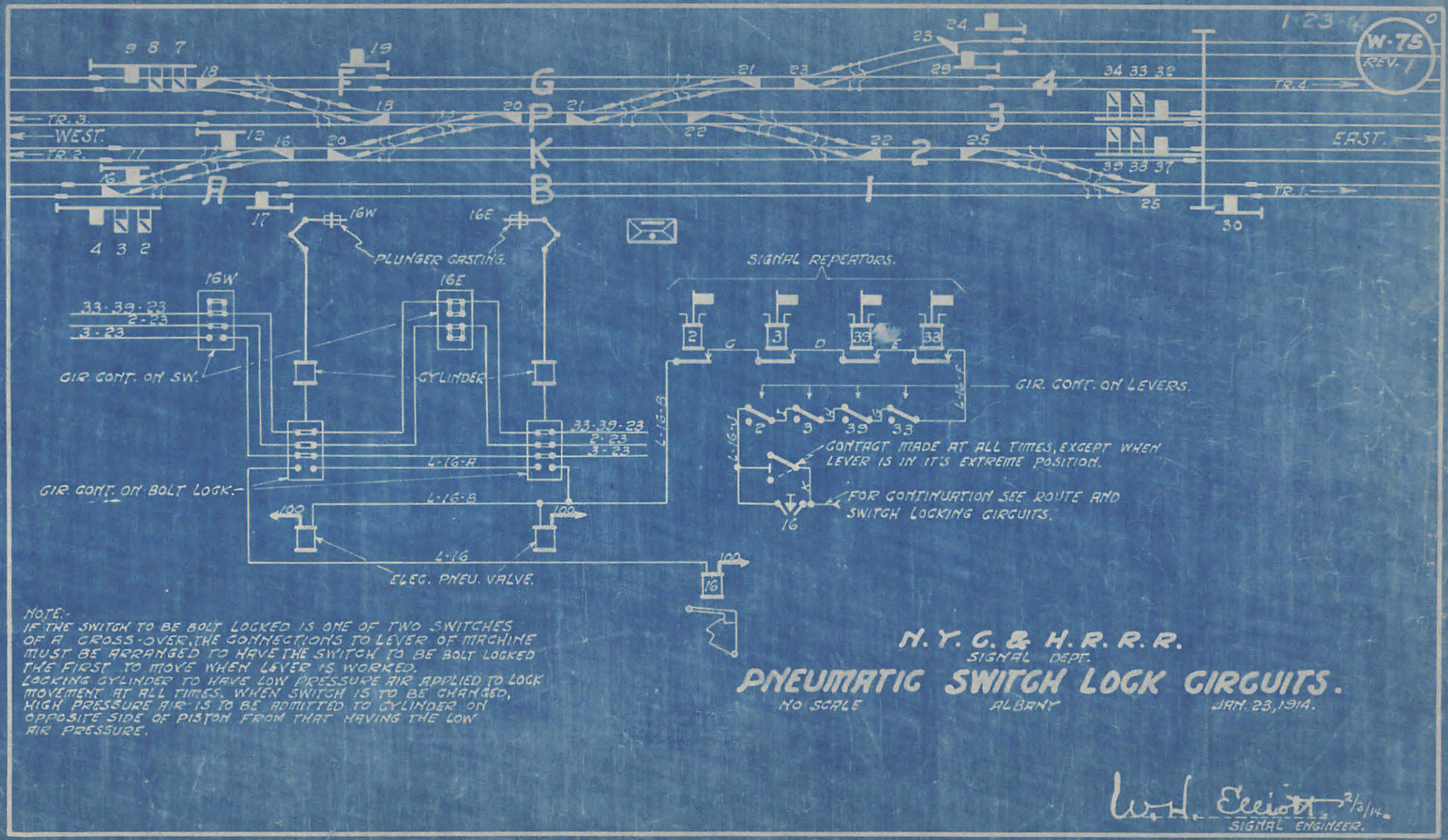


N.Y.C. & H.R.R.R.
B. & A.R.R.
SIGNAL DEPARTMENT

OUTLYING SWITCH LOCK CIRCUITS.
AUTOMATIC SIGNAL TERRITORY.
NO TRACK CIRCUIT CONTROL.

ALBANY, NOV. 24-09.

W. H. Elliott 11/26
SIGNAL ENGINEER



NOTE:-
IF THE SWITCH TO BE BOLT LOCKED IS ONE OF TWO SWITCHES OF A CROSS-OVER, THE CONNECTIONS TO LEVER OF MACHINE MUST BE ARRANGED TO HAVE THE SWITCH TO BE BOLT LOCKED THE FIRST TO MOVE WHEN LEVER IS WORKED.
LOCKING CYLINDER TO HAVE LOW PRESSURE AIR APPLIED TO LOCK MOVEMENT AT ALL TIMES. WHEN SWITCH IS TO BE CHANGED, HIGH PRESSURE AIR IS TO BE ADMITTED TO CYLINDER ON OPPOSITE SIDE OF PISTON FROM THAT HAVING THE LOW AIR PRESSURE.

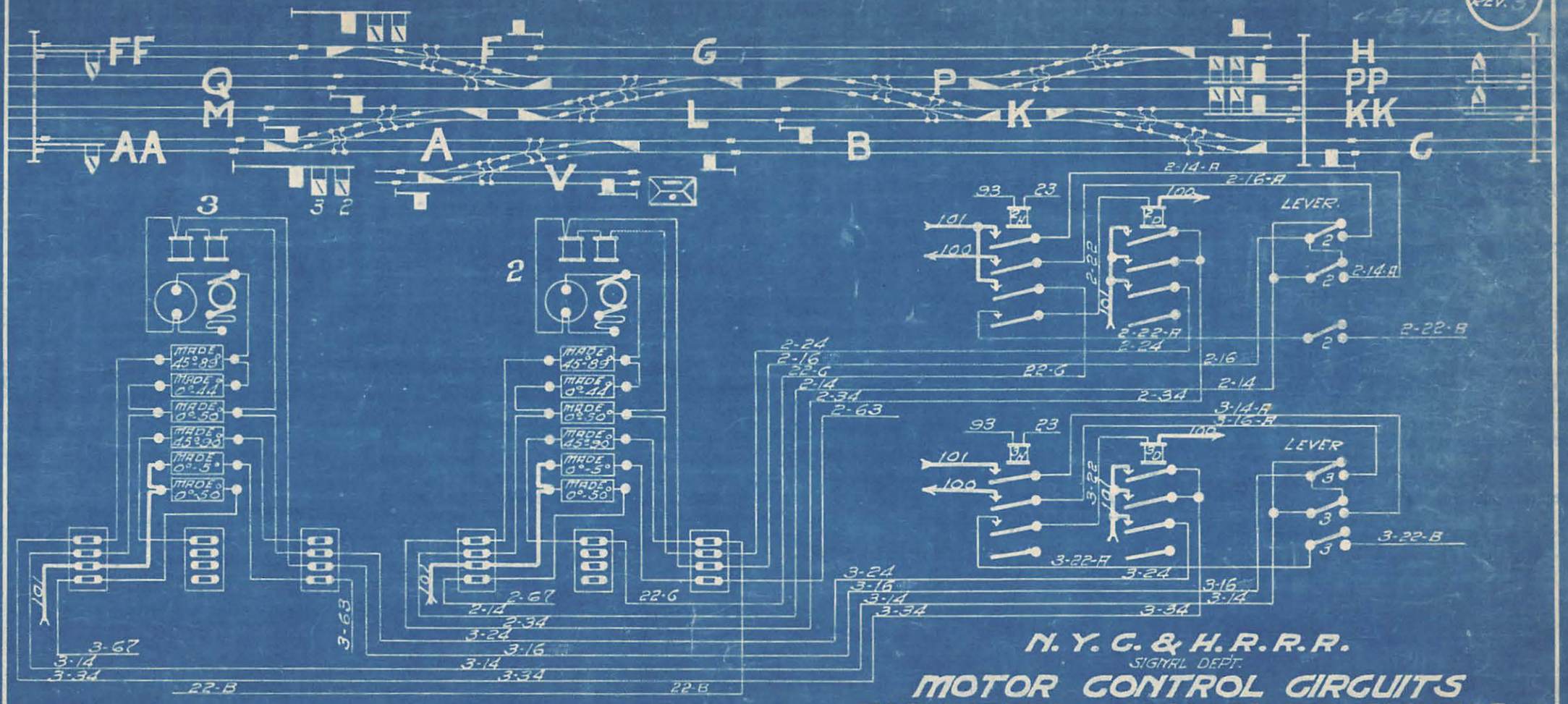
N.Y.C. & H.R.R.R.
SIGNAL DEPT.

PNEUMATIC SWITCH LOCK CIRCUITS.

NO SCALE — ALBANY — JAN. 23, 1914.

W. H. Elliott 2/3/14.
SIGNAL ENGINEER.

W-76
REV. 3



NOTE:-
HOME RELAY CONTROL WIRE # 23 TO BE ARRANGED AS SHOWN ON PLAN W-64,

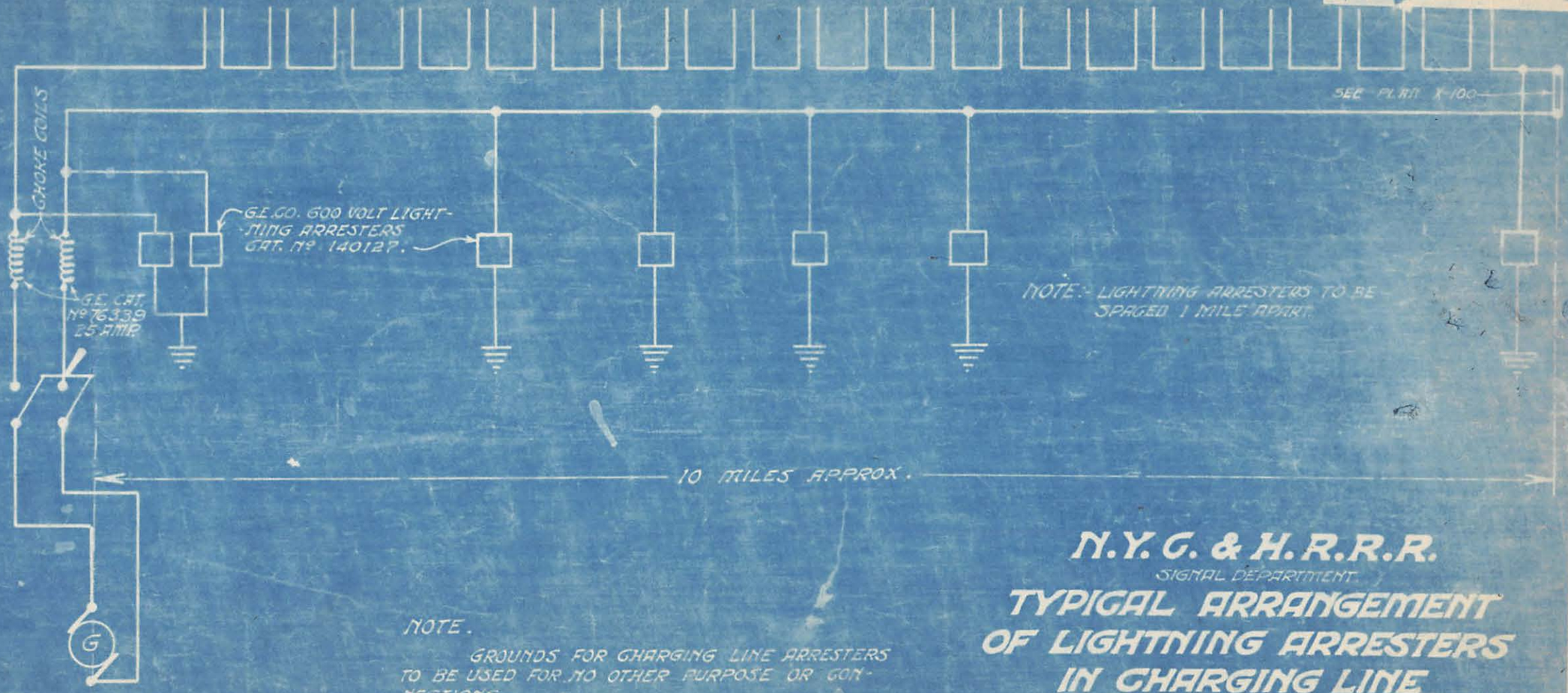
N. Y. C. & H. R. R. R.
SIGNAL DEPT.

MOTOR CONTROL CIRCUITS FOR INTERLOCKING HOME SIGNALS.

MECHANICAL INTERLOCKING. STYLE "H" SIGNALS.
NOT TO SCALE ALBANY. NOV. 18-1910.

W. H. Elliott 4/13/12.
SIGNAL ENGINEER

W-82
REV. 5
3-27-13.



NOTE:- LIGHTNING ARRESTERS TO BE SPACED 1 MILE APART.

NOTE.

GROUNDS FOR CHARGING LINE ARRESTERS TO BE USED FOR NO OTHER PURPOSE OR CONNECTIONS.

N.Y.C. & H.R.R.R.

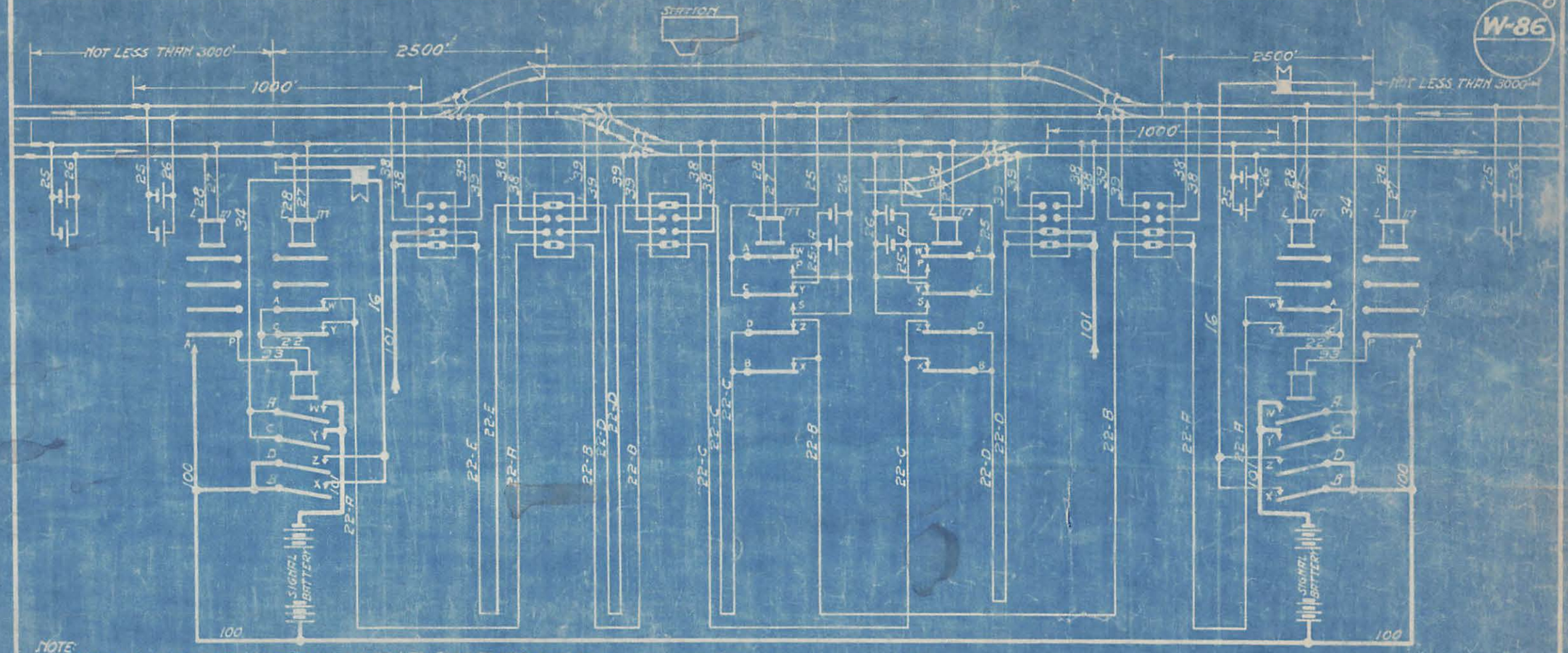
SIGNAL DEPARTMENT.

TYPICAL ARRANGEMENT OF LIGHTNING ARRESTERS IN CHARGING LINE

ALBANY, MARCH 15-1910.

W.H. Elliott
SIGNAL ENGINEER.

W-86



NOTE:

TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT. FOR CINDER, 3500 FT. FOR GRAVEL AND 4000 FT. FOR ROCK BALLASTED TRACK.

WHERE A DISTANT SWITCH SIGNAL IS TO BE USED AS A DISTANT SIGNAL FOR A MANUAL BLOCK SIGNAL, LINE WIRE CIRCUITS MUST BE INSTALLED BETWEEN THE OFFICE AND THE SIGNAL, AND A CIRCUIT CONTROLLER MUST BE PLACED ON THE MANUAL BLOCK SIGNAL.

CIRCUIT CONTROLLERS AT SWITCHES, ARE TO BE MADE TO OPEN LINE CIRCUIT TO SIGNAL WHEN A SWITCH IS OPENED.

WHERE IT IS DESIRED TO HAVE THE SIGNAL PROTECT ONLY THE SWITCHES LOCATED ON ONE SIDE OF THE STATION AND ON ONE END OF THE SIDE TRACK, ONLY ONE TRACK CIRCUIT SHOULD BE INSTALLED, PROVIDED THIS MAY BE MADE TO GIVE THE PROTECTION DESIRED.

FOR SPECIFICATIONS SEE PLAN Z-33.

N.Y.C.& H.R.R.R.

SIGNAL DEP'T.

NORMAL DANGER SWITCH SIGNAL CIRCUITS.

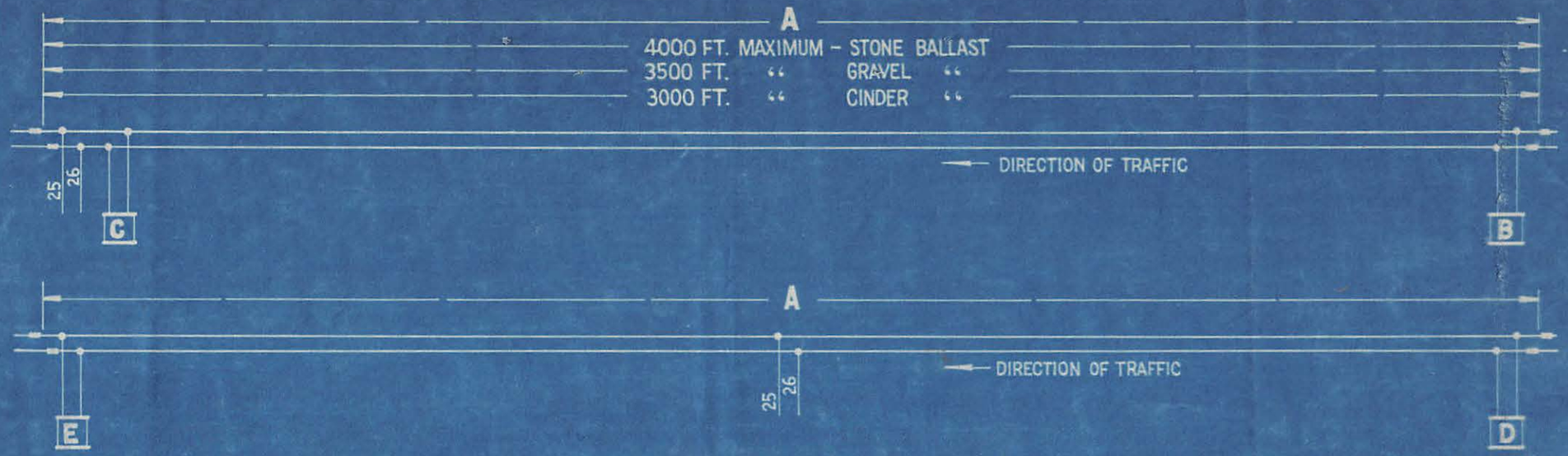
DOUBLE TRACK — BLOCKING IN ONE DIRECTION.

NOT TO SCALE ALBANY, N.Y. MAY 14, 1912.

W.H. Elliott. 5/14/12.

SIGNAL ENG'R.

W-89
REV. 2
5-26-19



WHERE "A" IS LESS THAN 500 FT., RELAY AND BATTERY MAY BE REVERSED.
WHERE "A" IS IN EXCESS OF 1000 FT., RELAY LEADS SHALL NOT EXCEED 150 FT. IN TOTAL LENGTH.
WHERE "A" IS LESS THAN 1000 FT., RELAY LEADS SHALL NOT EXCEED 500 FT. IN TOTAL LENGTH.

BATTERY LEADS SHALL NOT EXCEED 600 FT. IN TOTAL LENGTH.

CENTER FED TRACK CIRCUITS SHALL BE INSTALLED ONLY WHERE FOREIGN CURRENT IS PRESENT AND WHEN APPROVED BY SIGNAL ENGINEER.

WITH CAUSTIC SODA PRIMARY BATTERY, 7 OHM RELAYS SHALL BE USED FOR TRACK CIRCUITS 1200 FT. OR LESS IN LENGTH AND 4 OHM RELAYS FOR LONGER TRACK CIRCUITS.

RESISTANCE OF MULTIPLE RELAYS SPECIFIES PRACTICE WHERE THIS ARRANGEMENT IS USED, FURTHER INSTALLATIONS SHALL NOT BE MADE.

A	B RESISTANCE		C RESISTANCE		D RESISTANCE		E RESISTANCE	
	STANDARD	ALLOWED	STANDARD	ALLOWED	STANDARD	ALLOWED	STANDARD	ALLOWED
600' OR LESS	11	16	11	16	11	16	11	16
601' TO 1200'	11	12	11	16	11	12	11	12
1201' TO 1600'	7	9	11	16	7	9	7	9
1600' TO 3000'	4	4	11	12	7	7	7	7
3000' OR OVER	4	4	11	12	4	4	4	4

N.Y.C.R.R.

SIGNAL DEPT.

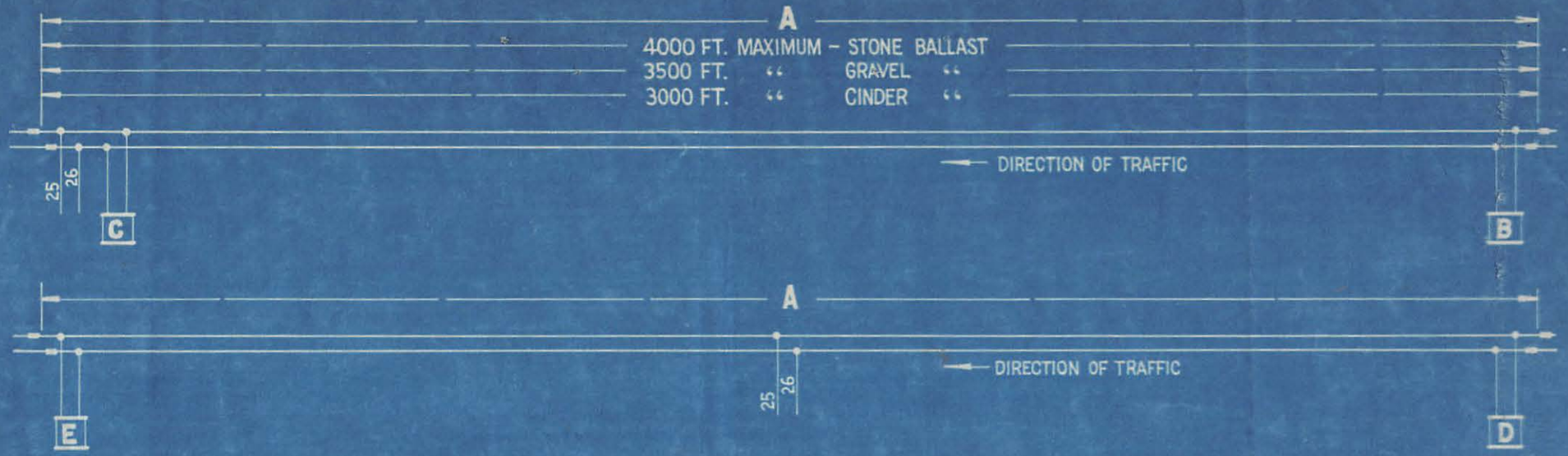
TRACK RELAY RESISTANCE

ALBANY, MAY 26TH 1919.

W.H. Elliott 6/11/19.

SIGNAL ENGINEER.

W-89
REV. 2
5-26-19



WHERE "A" IS LESS THAN 500 FT., RELAY AND BATTERY MAY BE REVERSED.
WHERE "A" IS IN EXCESS OF 1000 FT., RELAY LEADS SHALL NOT EXCEED 150 FT. IN TOTAL LENGTH.
WHERE "A" IS LESS THAN 1000 FT., RELAY LEADS SHALL NOT EXCEED 500 FT. IN TOTAL LENGTH.

BATTERY LEADS SHALL NOT EXCEED 600 FT. IN TOTAL LENGTH.

CENTER FED TRACK CIRCUITS SHALL BE INSTALLED ONLY WHERE FOREIGN CURRENT IS PRESENT AND WHEN APPROVED BY SIGNAL ENGINEER.

WITH CAUSTIC SODA PRIMARY BATTERY, 7 OHM RELAYS SHALL BE USED FOR TRACK CIRCUITS 1200 FT. OR LESS IN LENGTH AND 4 OHM RELAYS FOR LONGER TRACK CIRCUITS.

RESISTANCE OF MULTIPLE RELAYS SPECIFIES PRACTICE WHERE THIS ARRANGEMENT IS USED, FURTHER INSTALLATIONS SHALL NOT BE MADE.

A	B RESISTANCE		C RESISTANCE		D RESISTANCE		E RESISTANCE	
	STANDARD	ALLOWED	STANDARD	ALLOWED	STANDARD	ALLOWED	STANDARD	ALLOWED
600' OR LESS	11	16	11	16	11	16	11	16
601' TO 1200'	11	12	11	16	11	12	11	12
1201' TO 1600'	7	9	11	16	7	9	7	9
1600' TO 3000'	4	4.	11	12	7	7	7	7
3000' OR OVER	4	4	11	12	4	4	4	4

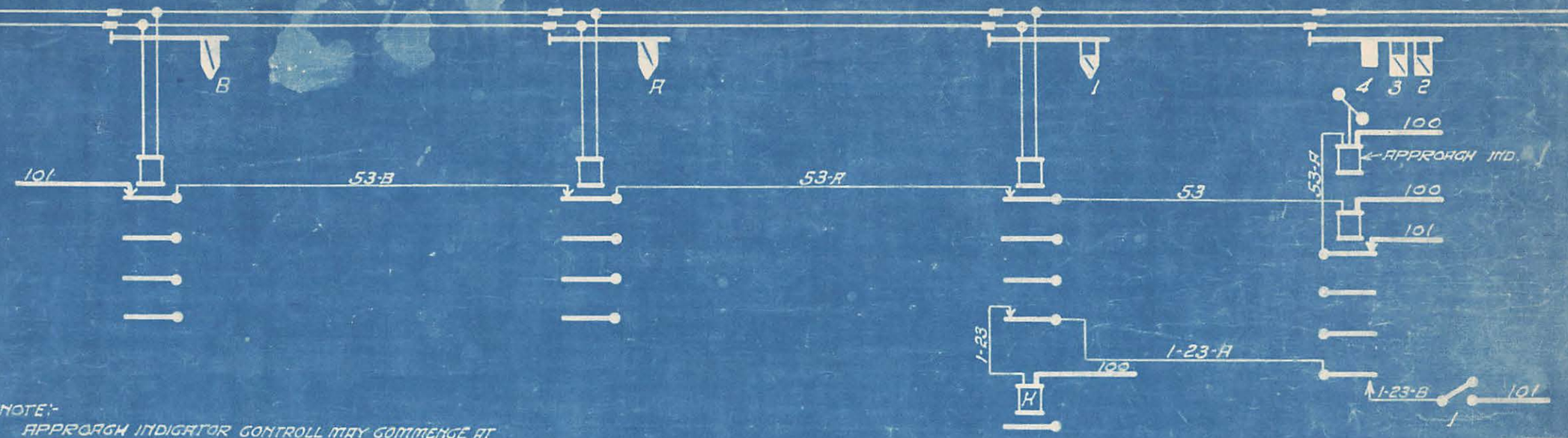
N.Y.C.R.R.
SIGNAL DEPT.

TRACK RELAY RESISTANCE

ALBANY, MAY 26TH 1919.

W. H. Elliott 6/11/19
SIGNAL ENGINEER

W-90°



NOTE:-
APPROACH INDICATOR CONTROLL MAY COMMENCE AT SIG. "R" WHERE LOCATED NOT LESS THAN 1-MILE IN REAR OF REAR HOME SIGNAL. IN SUCH CASES, HOME SIGNAL SHOULD BE CLEARED BY CIRCUIT OF APPROACH INDICATOR AND 93 WIRE SHOULD BE PROVIDED FOR REAR HOME SIGNAL FROM PROPER CLEARING DISTANCE.

N. Y. C. & H. R. R. R.

SIGNAL DEPT.

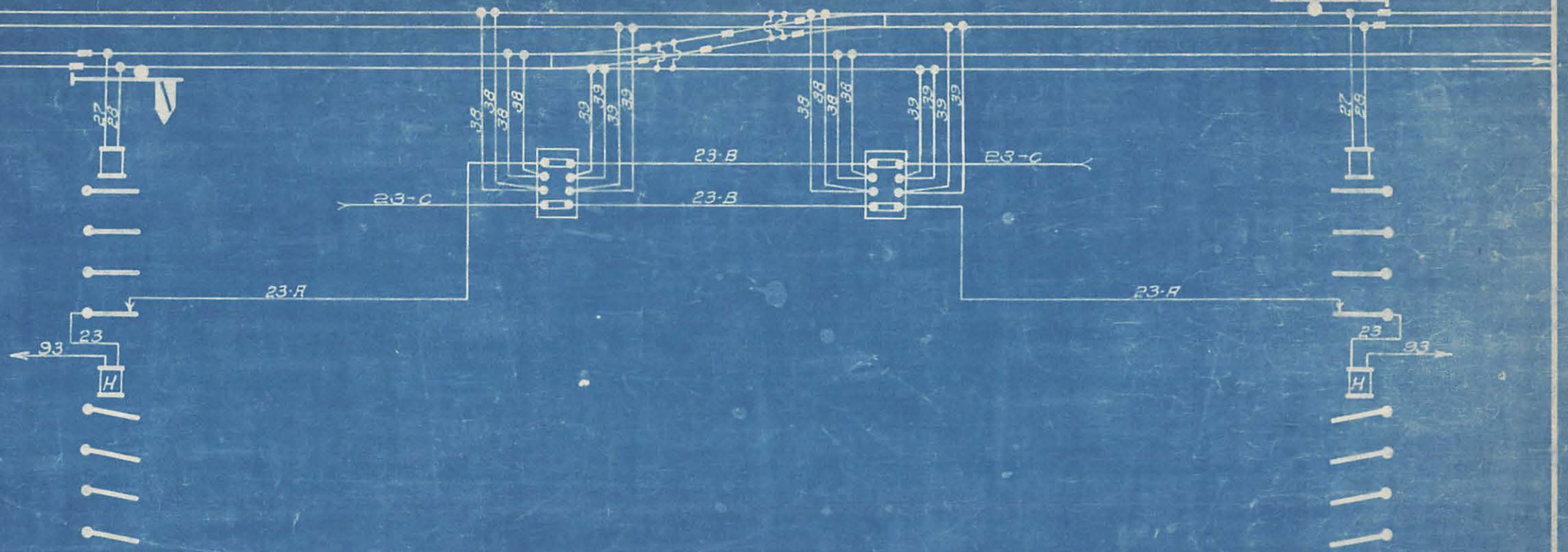
APPROACH INDICATOR CIRCUITS.

ALBANY. MARCH. 14, 1912.

W. H. Elliott 3/22/12

SIGNAL ENG'R.

W-91
REV. 1



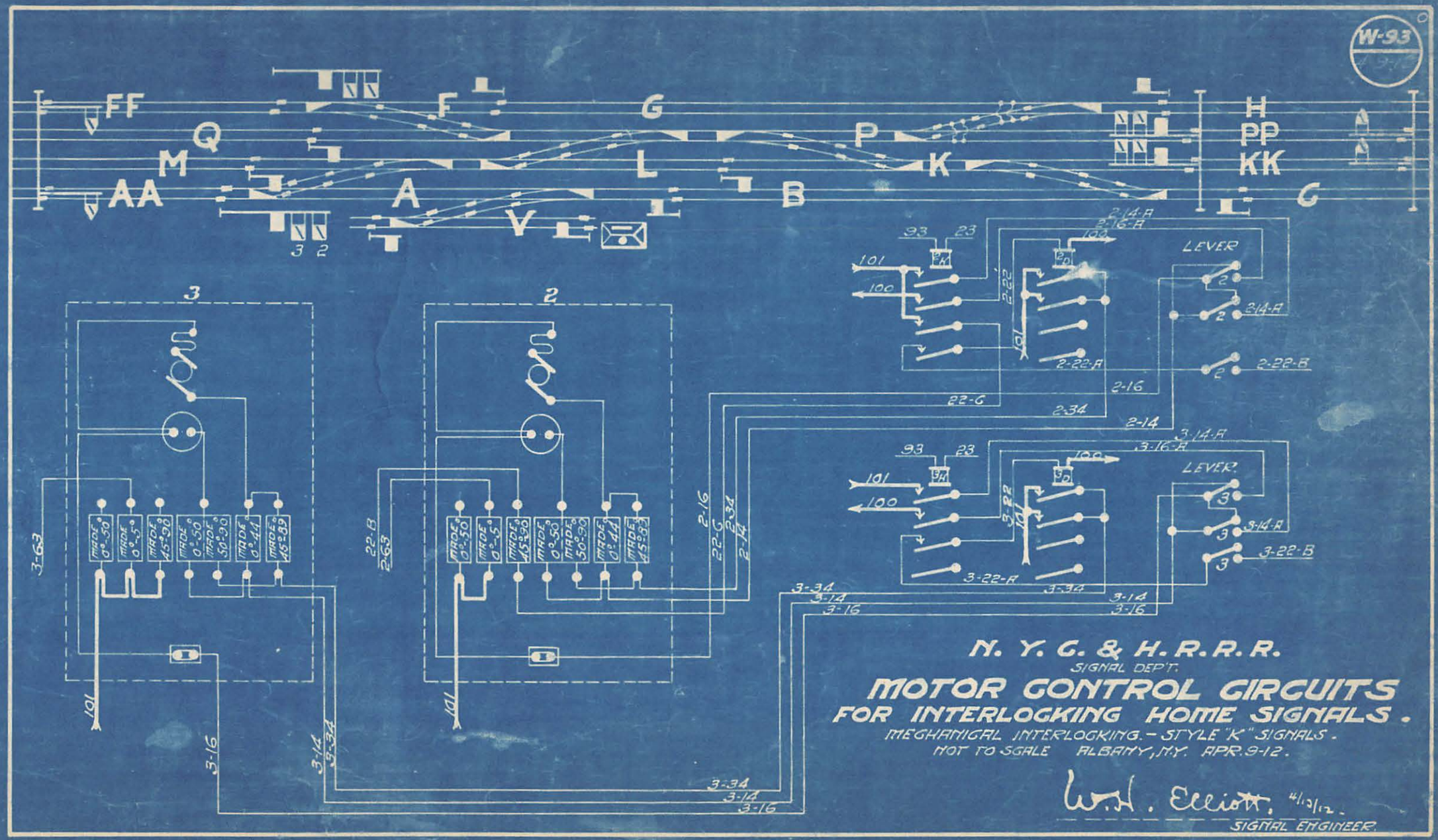
NOTE:-
THE 23 WIRES TO BE CONTROLLED THROUGH OUTSIDE SPRINGS ON SWITCH CIRCUIT CONTROLLERS.
SWITCH CIRCUIT CONTROLLERS TO BE CONNECTED TO NORMALLY CLOSED SIDE OF SWITCH AND ARRANGED SO THAT THE MOVEMENT OF THE SWITCH WILL MECHANICALLY OPEN CONTACTS OF LINE CIRCUIT TO SIGNAL.
SEE CIRCUIT PLAN SPECIFICATIONS Z-39, Z-52, Z-53 & Z-54.

N.Y.C.R.R.
SIGNAL DEPT.

HOME CONTROL CIRCUITS FOR AUTOMATIC POWER SIGNALS.

NO SCALE. ALBANY, N.Y. MARCH 20, 1912

W.H. Elliott 3/22/12
SIGNAL ENG'R.



N. Y. C. & H. R. R. R.

SIGNAL DEP'T.

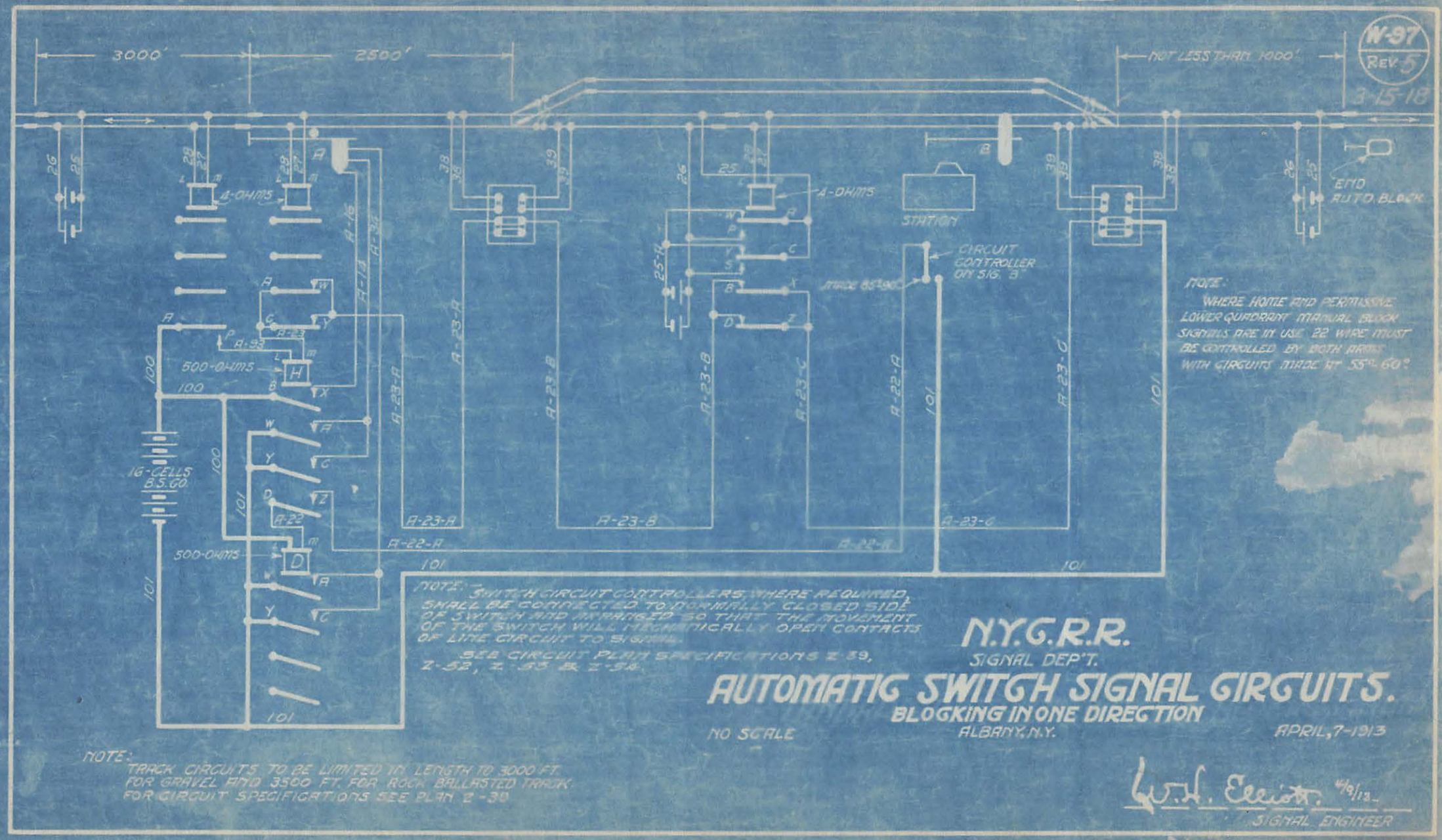
MOTOR CONTROL CIRCUITS FOR INTERLOCKING HOME SIGNALS.

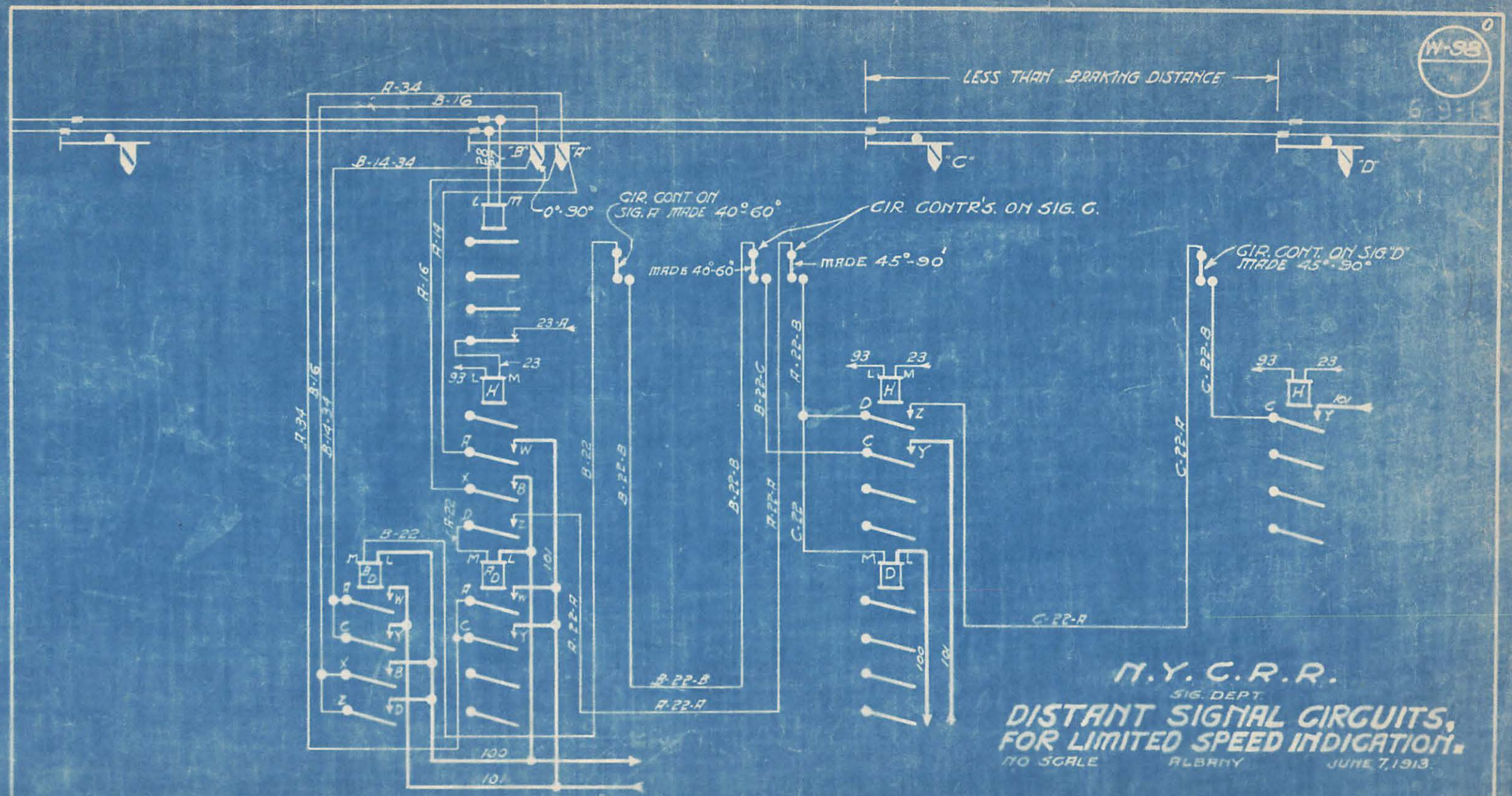
MECHANICAL INTERLOCKING. - STYLE "K" SIGNALS.

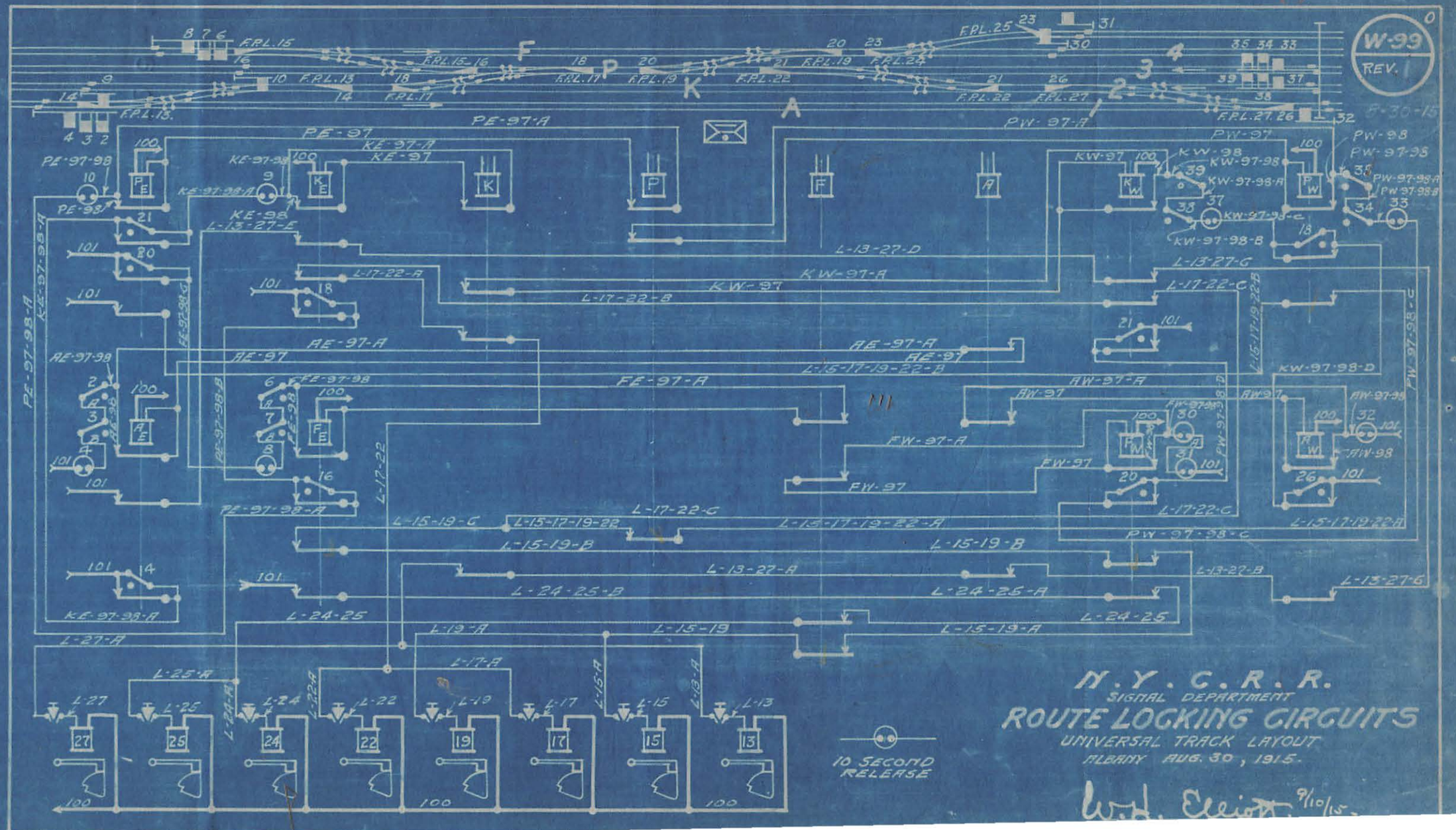
NOT TO SCALE ALBANY, N.Y. APR. 9-12.

W. H. Elliott. 4/12/12.

SIGNAL ENGINEER.


3000'
2500'
NOT LESS THAN 1000'
W-97
REV. 5
3-15-18
4-OHMS
STATION
CIRCUIT CONTROLLER ON SIG. B
END AUTO. BLOCK
500-OHMS
16-CELLS B.S.CO.
A-23-A
A-23-B
A-23-C
A-22-A
A-22-B
A-22
100
101
NOTE:
WHERE HOME AND PERMISSIVE LOWER QUADRANT MANUAL BLOCK SIGNALS ARE IN USE 22 WIRE MUST BE CONTROLLED BY BOTH ARMS WITH CIRCUITS MADE AT 55° - 60°
NOTE:- SWITCH CIRCUIT CONTROLLERS, WHERE REQUIRED, SHALL BE CONNECTED TO NORMALLY CLOSED SIDE OF SWITCH AND ARRANGED SO THAT THE MOVEMENT OF THE SWITCH WILL MECHANICALLY OPEN CONTACTS OF LINE CIRCUIT TO SIGNAL.
SEE CIRCUIT PLAN SPECIFICATIONS Z-39, Z-52, Z-53 & Z-54.
NOTE:
TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT. FOR GRAVEL AND 3500 FT. FOR ROCK BALLASTED TRACK. FOR CIRCUIT SPECIFICATIONS SEE PLAN Z-30
N.Y.C.R.R.
SIGNAL DEP'T.
AUTOMATIC SWITCH SIGNAL CIRCUITS.
BLOCKING IN ONE DIRECTION
ALBANY, N.Y.
NO SCALE
APRIL, 7-1913
W.H. Elliott 4/9/13
SIGNAL ENGINEER


W-98
LESS THAN BRAKING DISTANCE
"A"
"B"
"C"
"D"
0°-90°
CIR. CONT ON SIG. A MADE 40°-60°
CIR. CONTR'S. ON SIG. C.
MADE 40°-60°
MADE 45°-90°
CIR. CONT. ON SIG. "D" MADE 45°-90°
A-34
B-16
B-14-34
A-16
A-14
23-A
23
93
H
B-22
A-22
B-22-B
A-22-A
B-22-C
A-22-B
C-22
C-22-A
D
100
10
N. Y. C. R. R.
SIG. DEPT.
DISTANT SIGNAL CIRCUITS, FOR LIMITED SPEED INDICATION.
NO SCALE
ALBANY
JUNE 7, 1913.
W. H. Elliott. 7/1/13.
SIGNAL ENGINEER


W-99
REV. 1
8-30-15
F.P.L.15
F.P.L.16
F.P.L.13
F.P.L.11
F.P.L.19
F.P.L.22
F.P.L.24
F.P.L.25
F.P.L.27.26
PE-97
PE-97-A
PE-97-98
PE-98
KE-97
KE-97-A
KE-97-98
KE-97-98-A
KE-97-98-B
KE-97-98-C
L-13-27-E
L-17-22-A
L-17-22-B
L-13-27-D
KW-97
KW-97-A
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KW-97-98-A
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PW-97-98-B
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L-13-27-G
L-17-22-C
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AE-97-98
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FE-97-98-B
FE-97-98-C
FE-97-A
AW-97
AW-97-A
AW-97-98
FW-97
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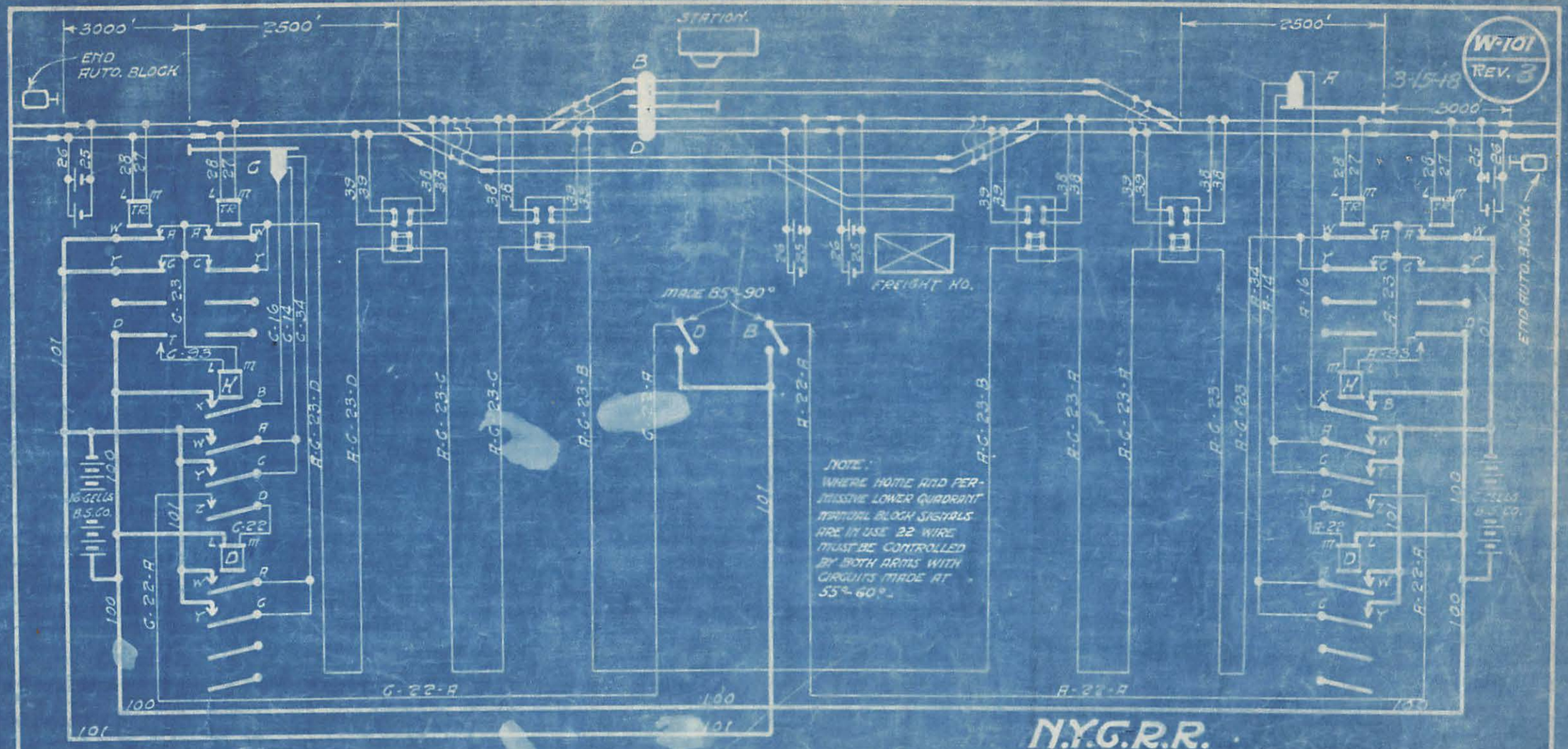
FW-97-98
FW-97-98-A
FW-97-98-B
FW-97-98-C
AIW-98
L-15-19-C
L-15-17-19-22
L-15-17-19-22-A
L-15-19-B
L-13-27-A
L-24-25-B
L-24-25-A
L-24-25
L-13-27-B
L-13-27-6
L-27-A
L-19-A
L-15-19
L-15-19-A
L-17-A
L-25-A
L-24-A
L-22-A
L-15-A
L-13-A
L-27
L-25
L-24
L-22
L-19
L-17
L-15
L-13
10 SECOND RELEASE
N. Y. C. R. R.
SIGNAL DEPARTMENT
ROUTE LOCKING CIRCUITS
UNIVERSAL TRACK LAYOUT
ALBANY AUG. 30, 1915.
W.H. Elliott 9/10/15.

SEP 17 1915



NOTE:
TRACK CIRCUITS TO BE LIMITED IN LENGTH TO 3000 FT., FOR GRAVEL AND 3500 FT. FOR ROCK BALLASTED TRACK.
SWITCH CIRCUIT CONTROLLERS, WHERE REQUIRED, SHALL BE CONNECTED TO NORMALLY CLOSED SIDE OF SWITCH AND ARRANGED SO THAT THE MOVEMENT OF THE SWITCH WILL MECHANICALLY OPEN CONTACTS OF LINE CIRCUIT TO SIGNAL.
FOR CIRCUIT SPECIFICATIONS SEE PLANS Z-51, Z-52, Z-53 & Z-54.

N.Y.C.R.R.

SIGNAL DEP'T.

AUTOMATIC SWITCH SIGNAL CIRCUITS.

BLOCKING IN BOTH DIRECTIONS

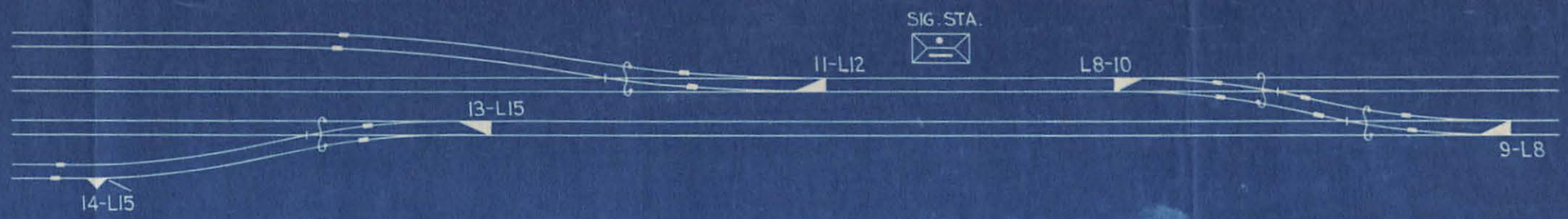
NO. SCALE

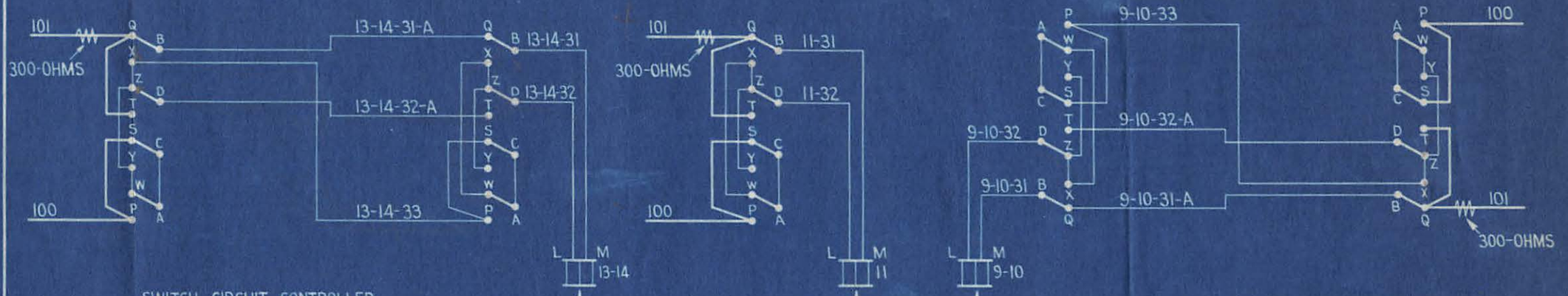
ALBANY, N.Y. FEB. 13-1914

W. J. Elliott 2/14/14

SIGNAL ENGINEER.

W-104
REV. 5
10-2-30





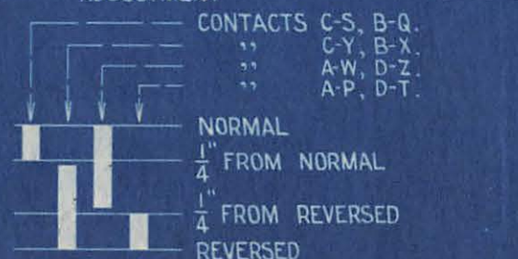
POLAR RELAYS
500 OHMS
CLASS "SS"

WHERE 250 OHM MOTOR RELAYS ARE USED RESISTANCE IN 101 WIRE SHALL BE 50 OHMS.

SWITCH CIRCUIT CONTROLLER

DESIGNATION

ADJUSTMENT



NOTE: FOR SWITCH CIRCUIT CONTROLLERS, OUTSIDE SWITCH MACHINE.
WITH SWITCH NORMAL, PLACE ROLLER IN SLOT ON CONTACTS C-Y-S & B-X-Q.
WITH SWITCH REVERSED, PLACE ROLLER IN SLOT ON CONTACTS A-W-P & D-Z-T.
ALL ROLLERS SHALL BE ON THE QUADRANT WHEN SWITCH IS MOVING BETWEEN NORMAL AND REVERSE.

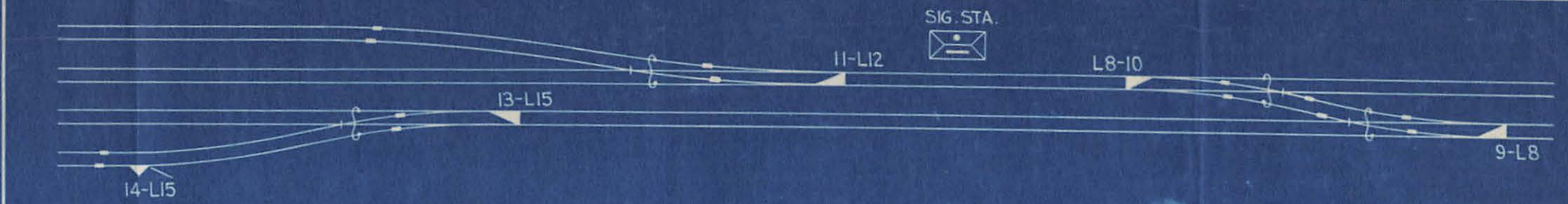
N. Y. C. R. R.
SIGNAL DEPARTMENT

INTERLOCKING SS RELAY CONTROL

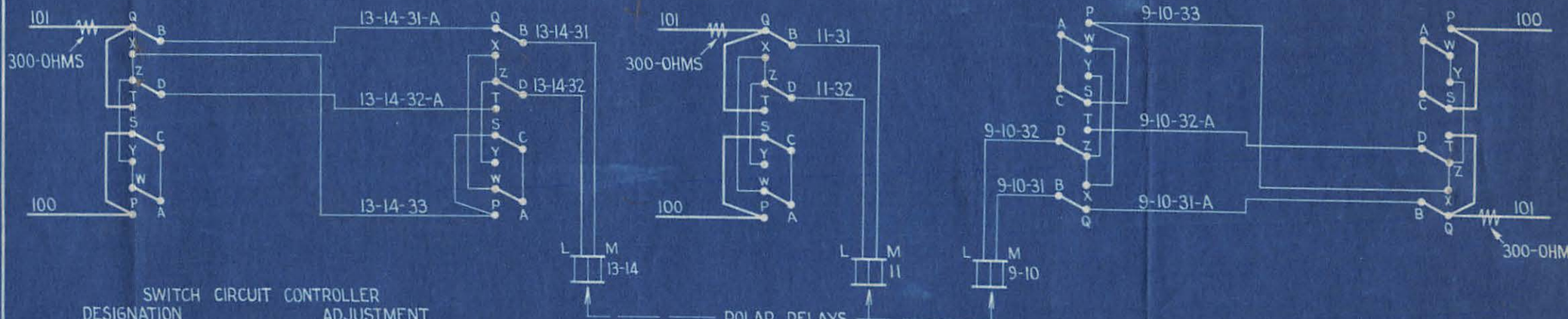
POLAR RELAYS

ALBANY, JULY 17, 1916

W. H. Elliott. 1916/30.



W-104
REV. 5
10-2-30



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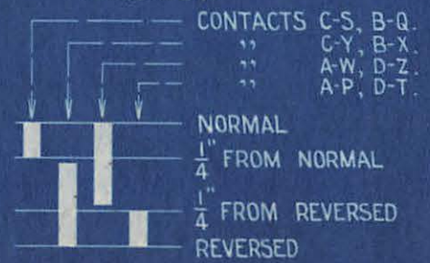
SWITCH CIRCUIT CONTROLLER

DESIGNATION

ADJUSTMENT



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N. Y. C. R. R.

SIGNAL DEPARTMENT

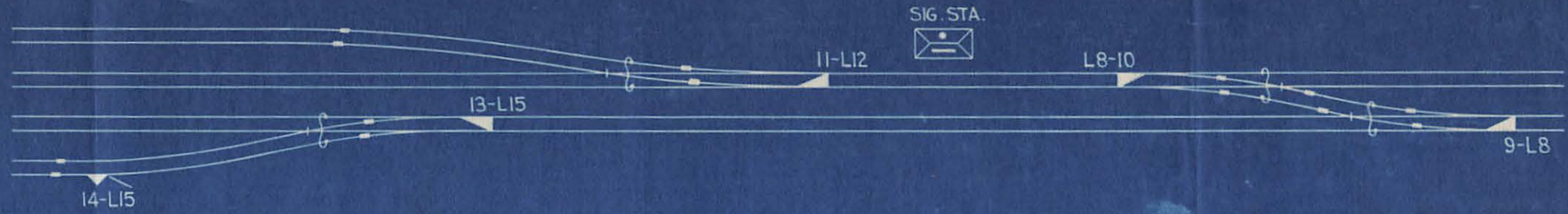
INTERLOCKING SS RELAY CONTROL

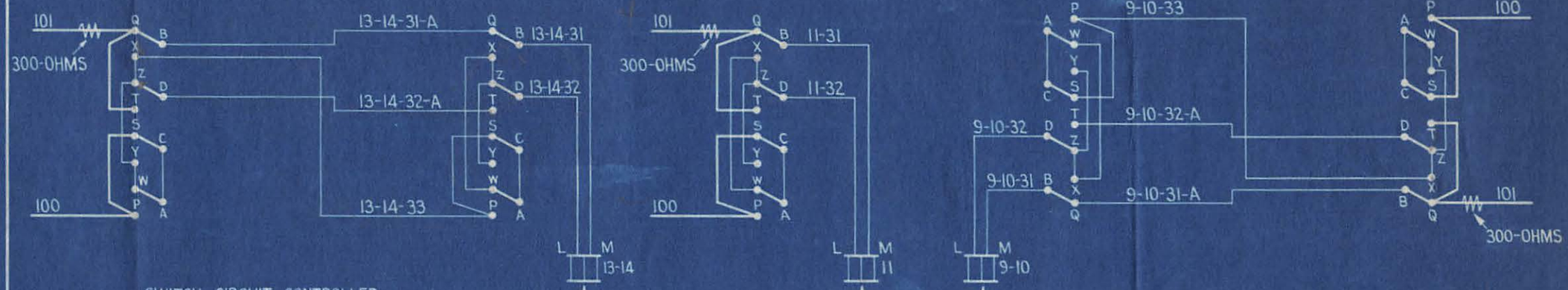
POLAR RELAYS

ALBANY, JULY 17, 1916

W. H. Elliott. 1916.

W-104
REV. 5
10-2-30





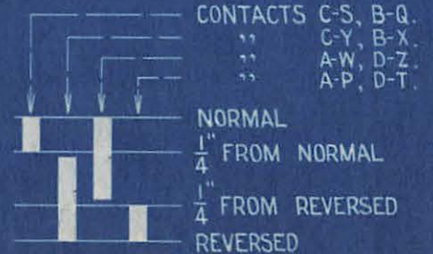
WHERE 250 OHM MOTOR RELAYS ARE USED RESISTANCE IN 101 WIRE SHALL BE 50 OHMS.

SWITCH CIRCUIT CONTROLLER

DESIGNATION

W	Y	Z	X
P	S	T	Q
A	C	D	B

ADJUSTMENT



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N. Y. C. R. R.

SIGNAL DEPARTMENT

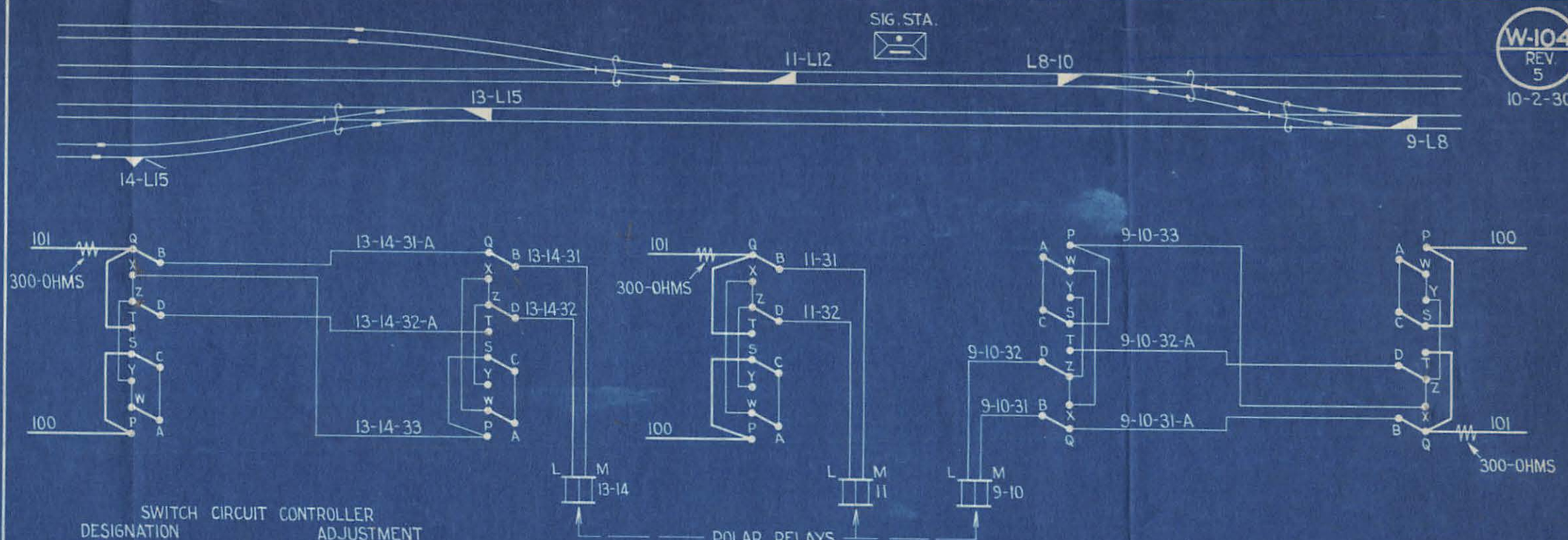
INTERLOCKING SS RELAY CONTROL

POLAR RELAYS

ALBANY, JULY 17, 1916

W. H. Elliott 10/5/30.

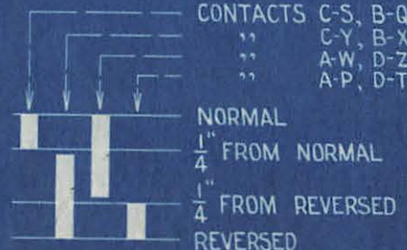
W-104
REV. 5
10-2-30



SWITCH CIRCUIT CONTROLLER

DESIGNATION

ADJUSTMENT



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N. Y. C. R. R.

SIGNAL DEPARTMENT

INTERLOCKING SS RELAY CONTROL

POLAR RELAYS

ALBANY, JULY 17, 1916

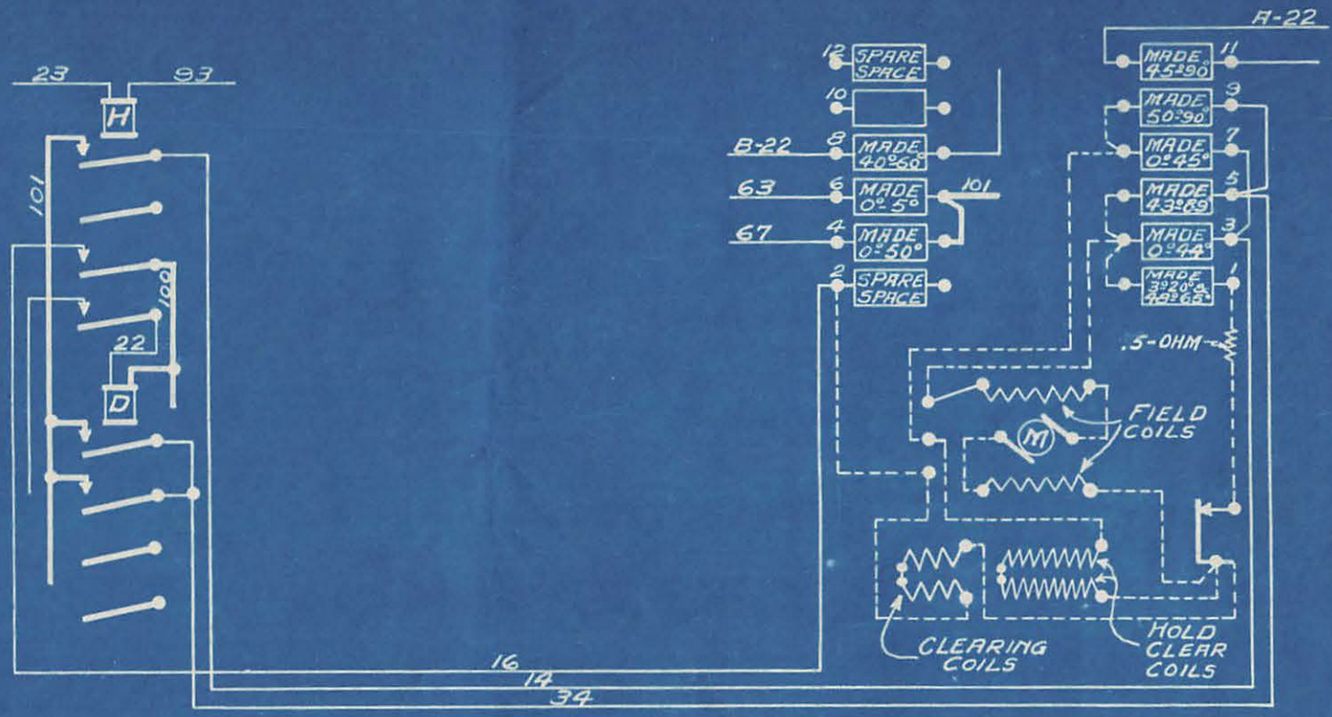
W. H. Elliott. 10/30.

DEPT. 41
OCT 24 1930
U. S. S. S. CO.

OCT 24 1930
A. M.
NOTE
ATTENTION
Ans'd.....
Date .....

W-109

7-2-18

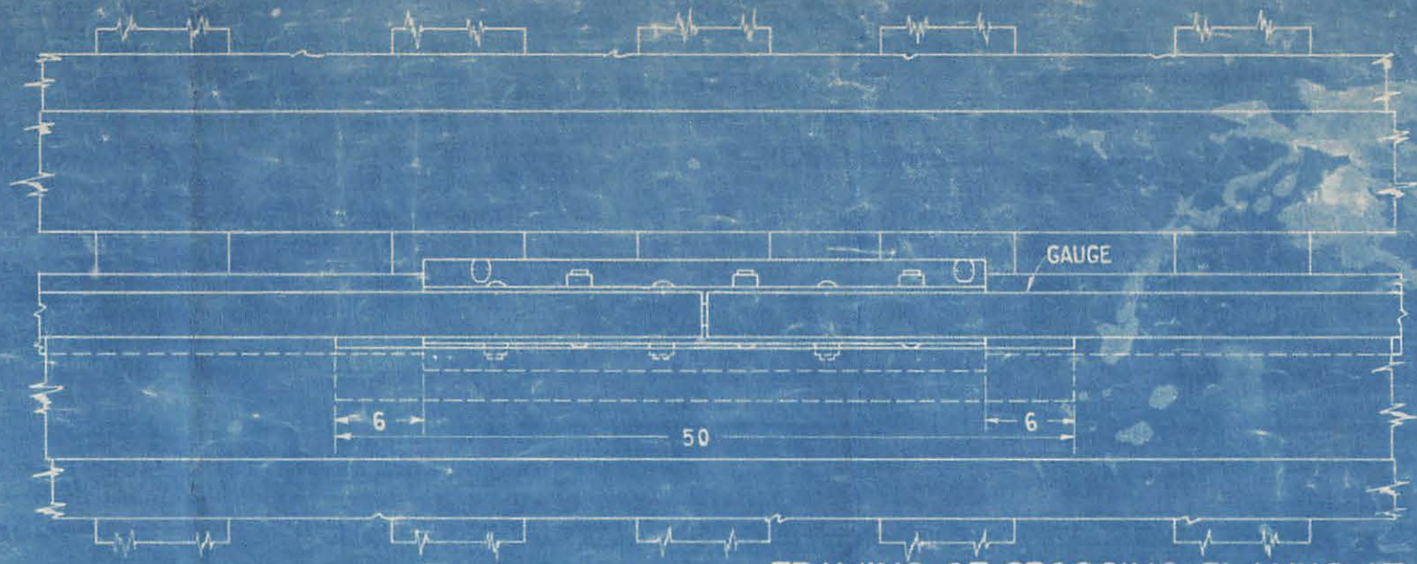


NOTE:-
ALL WIRE CONNECTIONS IN MECHANISM CASE ARE TO BE MADE TO TERMINAL POSTS.
NO SOLDERED JOINTS TO BE USED IN CASE.
*7 DRAG CONTACT CLOSED 43° TO 0° GOING NORMAL.

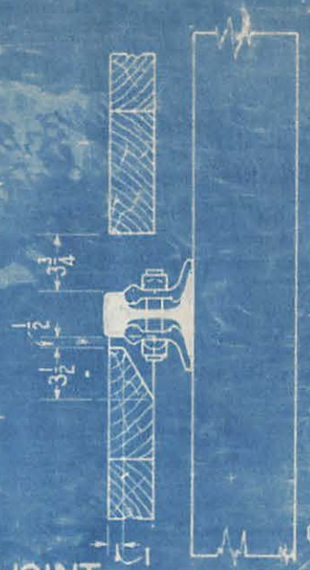
N.Y.C.R.R.
SIGNAL DEP'T.
MECHANISM WIRING FOR STYLE 'L' 3 POSITION SIGNAL
ALBANY - JULY 2, 1918

W. H. Elliott 7/3/18.
SIGNAL ENGINEER.

X-4
REV. 17
10-8-31



FRAMING OF CROSSING PLANKS AT JOINT

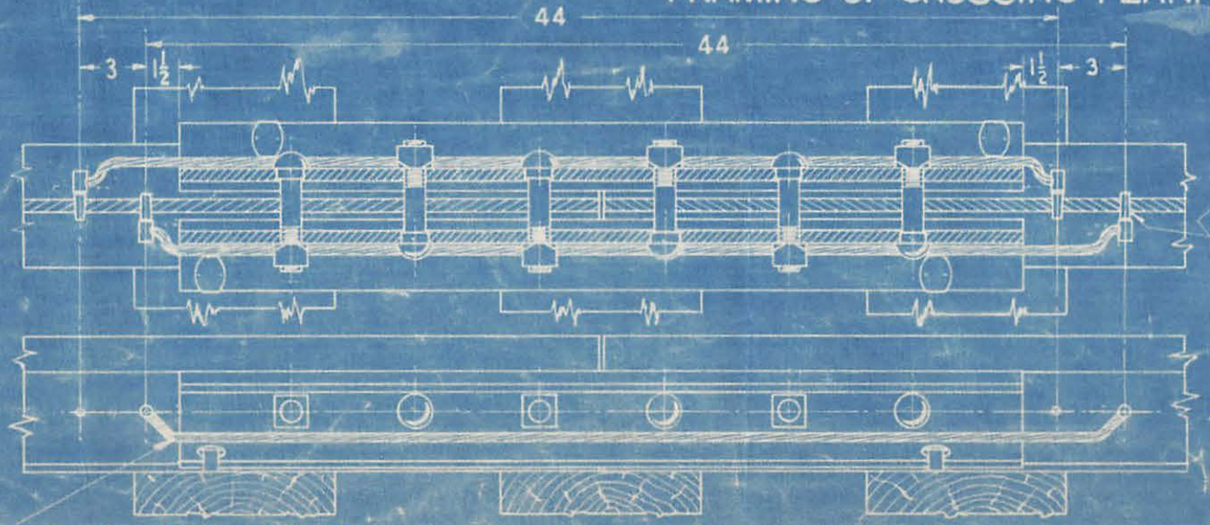


0 1 2 4 6 8 10 12

0 1 2 4 6 8 10 12

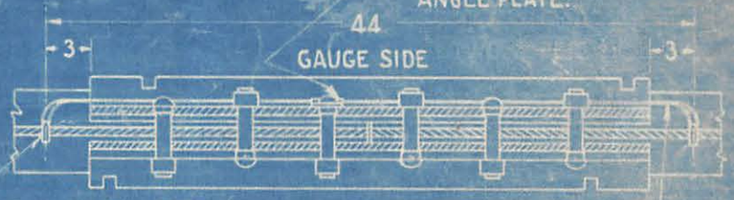
SCALES AND ALL DIMENSIONS GIVEN IN INCHES.

CORNER OF P.&M. BOND WIRE PROTECTOR SHALL BE TURNED UP 70° FROM FACE OF ANGLE PLATE.



TYPE S-3 SIGNAL PLUG BOND, 48" LONG, COMPOSED OF 7 NO. 10 A.W.G. ANNEALED COPPER WIRES, ASSEMBLED BY A.S. & W. CO.

BONDING AT CROSSING



3/8 DRILL ON CENTER LINE OF BOLT HOLES.

BONDING

TWO 53" LENGTHS, NO. 6 A.W.G. "COPPERWELD" OF 40% CONDUCTIVITY.

N. Y. C. R. R.

SIGNAL DEPARTMENT

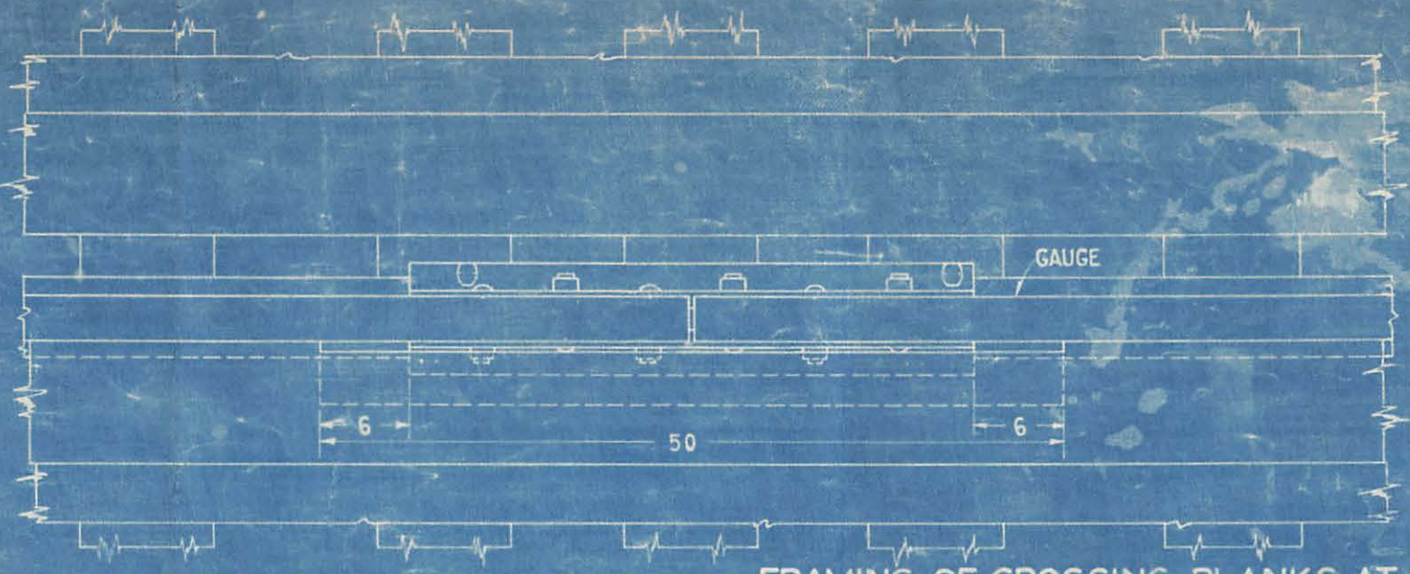
TRACK BONDING

ALBANY, JAN. 27, 1912.

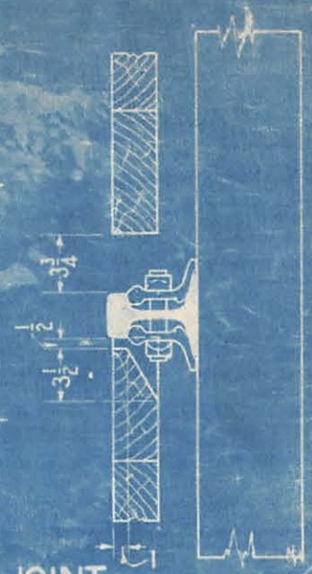
W. H. Elliott 1/31/25

SIGNAL ENGR.

X-4
REV. 17
10-8-31



FRAMING OF CROSSING PLANKS AT JOINT

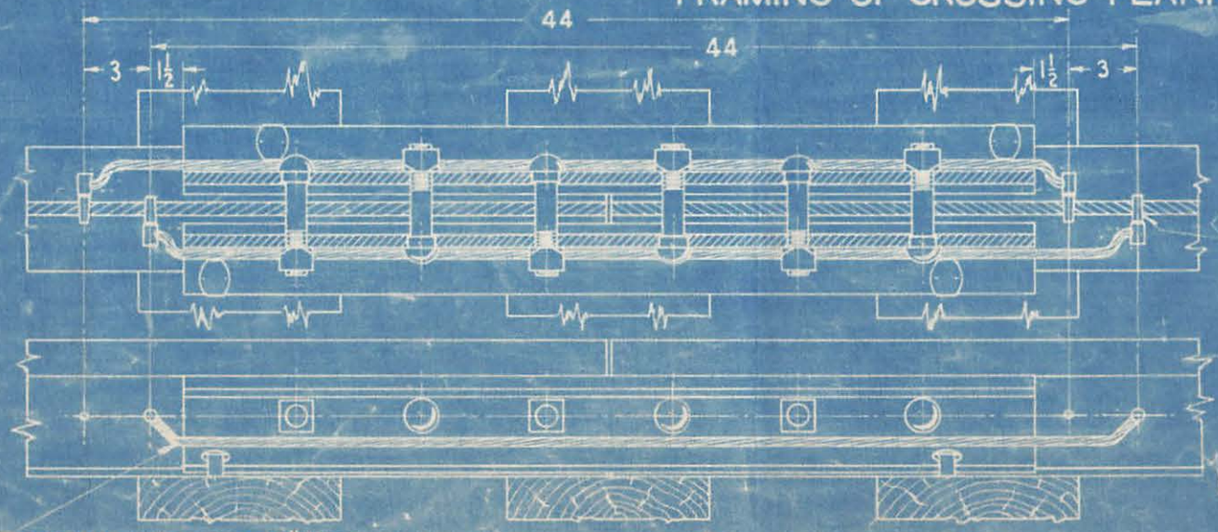


0 1 2 4 6 8 10 12

0 1 2 4 6 8 10 12

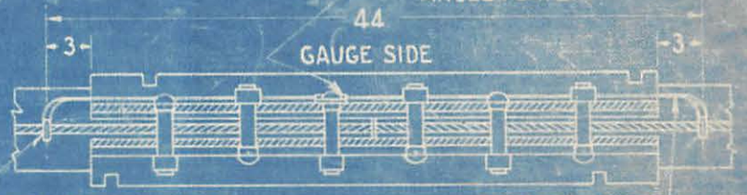
SCALES AND ALL DIMENSIONS GIVEN IN INCHES.

CORNER OF P.&M. BOND WIRE PROTECTOR SHALL BE TURNED UP 70° FROM FACE OF ANGLE PLATE.



TYPE-S-3 SIGNAL PLUG BOND, 48" LONG, COMPOSED OF 7 NO. 10 A.W.G. ANNEALED COPPER WIRES, AS MADE BY A.G.&W. CO.

BONDING AT CROSSING



$\frac{3}{8}$" DRILL ON CENTER LINE OF BOLT HOLES.

BONDING

TWO 53" LENGTHS, NO. 6 A.W.G. "COPPERWELD" OF 40% CONDUCTIVITY.

N. Y. C. R. R.
SIGNAL DEPARTMENT
TRACK BONDING
ALBANY, JAN. 27, 1912.

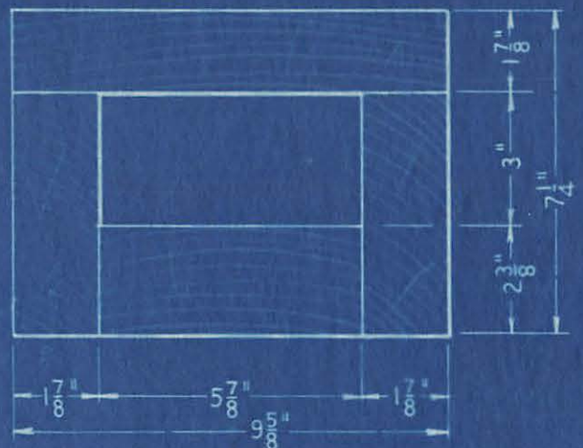
W. H. Elliott 11/3/25
SIGNAL ENGR.

U.S.A.A.C.O.
OCT 22 1931
DEPT. 41

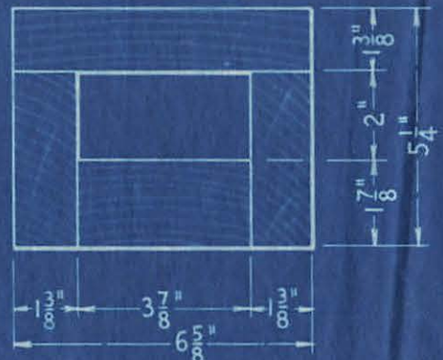
X-5
REV.
E

9-22-19

NOTE: FOR TRUNKING SPECIFICATIONS SEE PLANS Z-45 AND Z-46.



NO. 2



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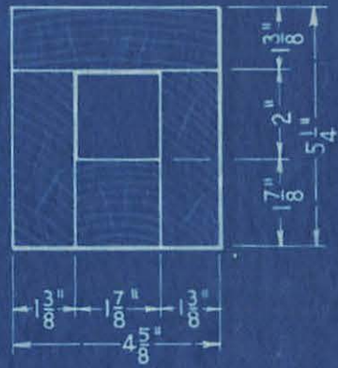

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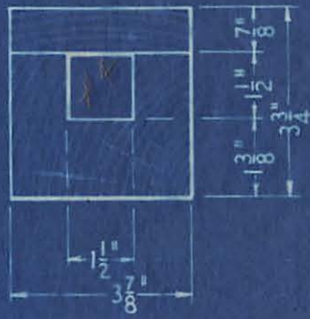

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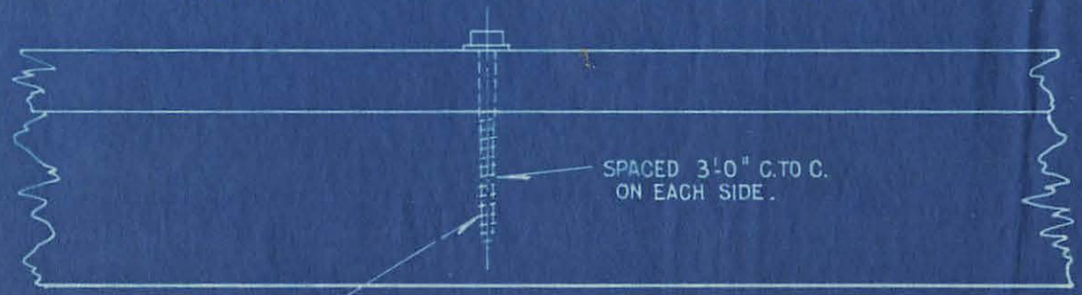


FOR NO. 2 TRUNKING, $\frac{3}{8}$" X 4" LAG SCREWS WITH WASHERS.
" " 3 " " $\frac{3}{8}$" X $3\frac{1}{2}$" " " " "

N.Y.C.R.R.

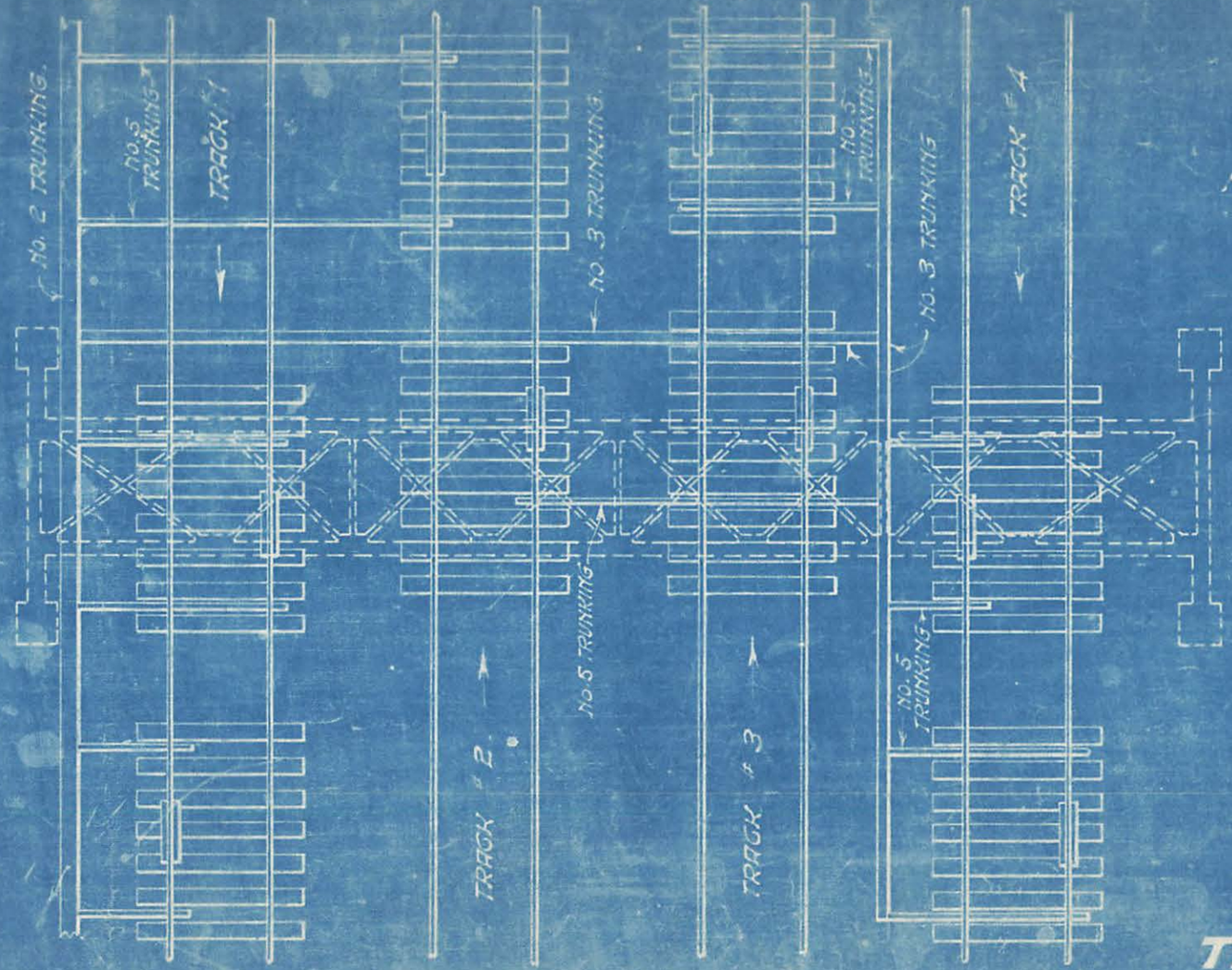
SIGNAL DEPARTMENT

TRUNKING AND CAPPING.

SCALE: 3" = 1'-0" ALBANY, SEPT. 22 - 1919.

W. H. Elliott 9/27/19

X-20
REV.



NOTE.- THIS ARRANGEMENT FOR INTERLOCKINGS ONLY.

NOTE.- AT POINTS WHERE LARGE LAYOUTS OF TRUNKING ARE TO BE PUT IN, THE SIGNAL SUPERVISOR WILL CONFER WITH DIVISION ENGINEER AND AGREE ON THE RUNNING OF TRUNKING AS NEARLY AS PRACTICABLE TO CONFORM TO THE STANDARD ARRANGEMENT SHOWN ON THIS DRAWING.
WHERE TRUNKING LEAD RUNS PARALLEL WITH AND OUTSIDE OF TRACKS AND CANNOT BE PLACED ONE INCH CLEAR OF GROUND AND HAVE TOP OF TRUNKING LEVEL WITH OR BELOW BOTTOM OF TIE, TRUNKING WILL BE PLACED WITH TOP OF TRUNKING ONE HALF INCH BELOW TOP OF RAIL.- WHERE TRUNKING IS PLACED BETWEEN TRACKS, IT WILL BE KEPT WITH BOTTOM OF GRIPPING EVEN WITH THE TOP OF BALLAST.

N. Y. C. & H. R. R. R.
B. & A. R. R.

SIGNAL DEPARTMENT

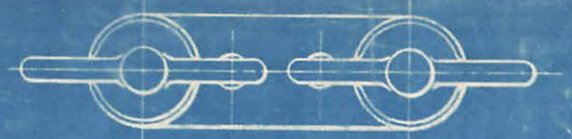
TRUNKING LOCATION.

FOUR TRACK INTERLOCKING ARRANGEMENT.

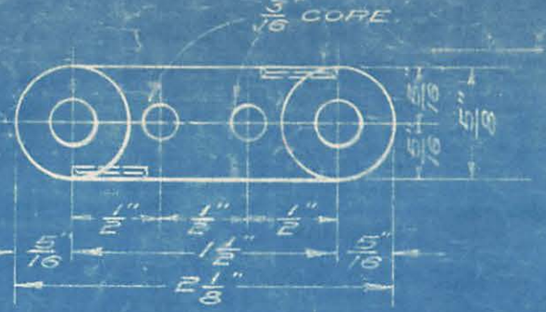
SCALE 1" = 1'. ALBANY, FEB. 28-10.

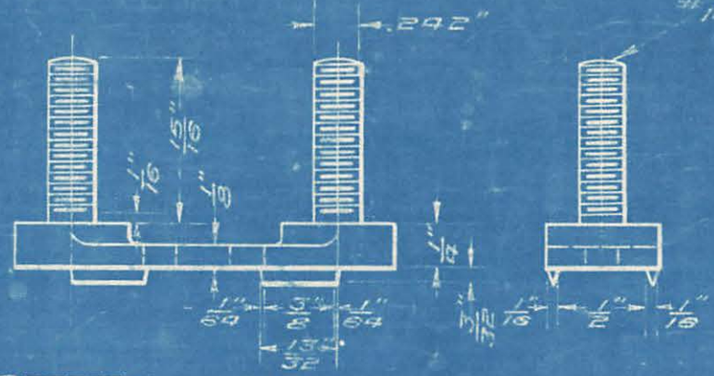
W. H. Elliott 9/3/10
SIGNAL ENGINEER.

X-25 Rev 2

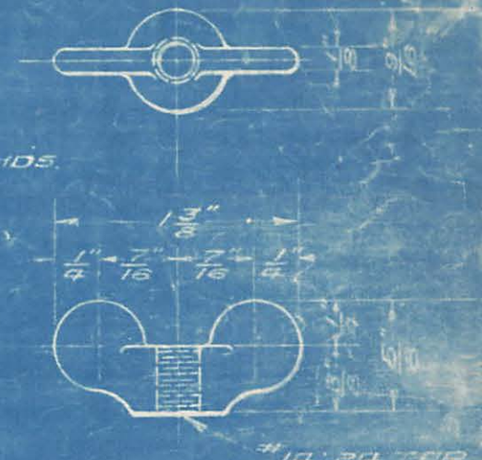


BATTERY CONNECTOR COMP.
S.D. 701.



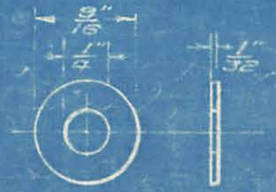


BATTERY CONNECTOR.
CAST BRASS – 1 WANTED.
S.D. 698.



THUMB NUT.
BRASS – 2 WANTED.
S.D. 615.

NUT.
BRASS – 2 WANTED.
S.D. 699



WASHER.
BRASS – 8 WANTED.
S.D. 700.

N.Y.C. & H.R.R.R.
SIGNAL DEPT.

BATTERY CONNECTOR.

SCALE: FULL SIZE. ALBANY, JAN. 20-11

W.H. Elliott 3/15/11
SIGNAL ENGR.

X-32

4-5-27

ITEM	WATTS	VOLTS	C.P.	BULB	CONTACT	BASE REFERENCE	USED FOR
1	—	12-16	3	G-6	SINGLE	BAYONET HANDLAN PRECISION LAMPS OR MAZDA-67	G.R.S. LEVER LIGHTS
2	—	12-16	3	G-6	DOUBLE	BAYONET HANDLAN PRECISION LAMP OR MAZDA-68	N.Y.C. STD. CHART LIGHTS
3	—	12-16	21	S-11	SINGLE	BAYONET HANDLAN PRECISION LAMP	COLOR LIGHT SIGS.
4	3	12	—	S-11	SINGLE	BAYONET HANDLAN PRECISION LAMP	SEMAPHORE AND MARKER LIGHTS
5	1.5	15	—	—	—	NO. 20 W.E.CO. TEL. APP. CO. CAT. NO. 5	DIRECTORS TRACK MODEL

N. Y. C. R. R.

SIGNAL DEPARTMENT

ELECTRIC LAMP CHART

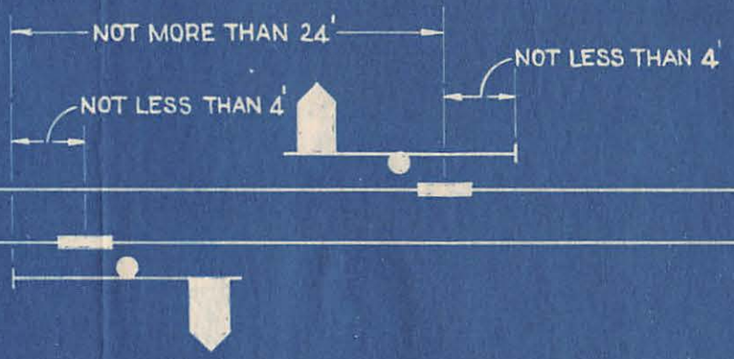
ALBANY, APRIL 5 -1927.

W. H. Elliott 5/5/27.

SIGNAL ENGINEER

X-34

1-16-28



N. Y. C. R. R.

SIGNAL DEPARTMENT

INSULATED JOINT LOCATION

ALBANY N.Y. APR. 18, 1928.

W. H. Elliott 11/30/28

SIGNAL ENGR.

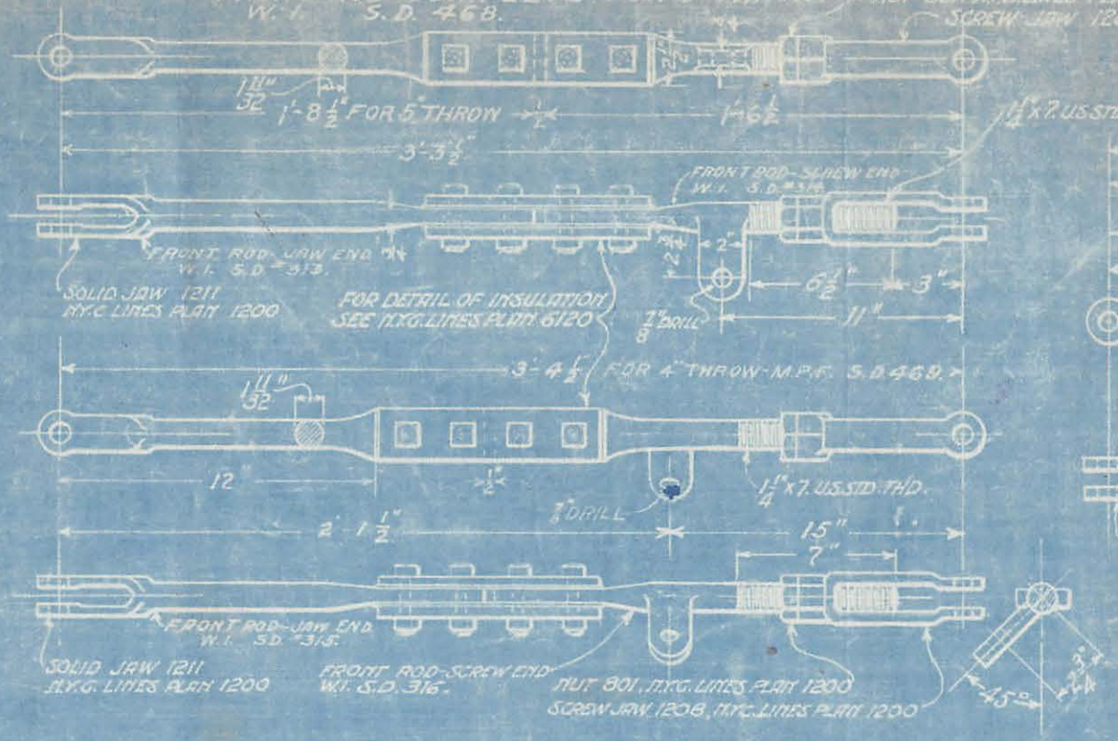
RECEIVED
SWISSVALE
APR
30
1928
MAILING DEPT.

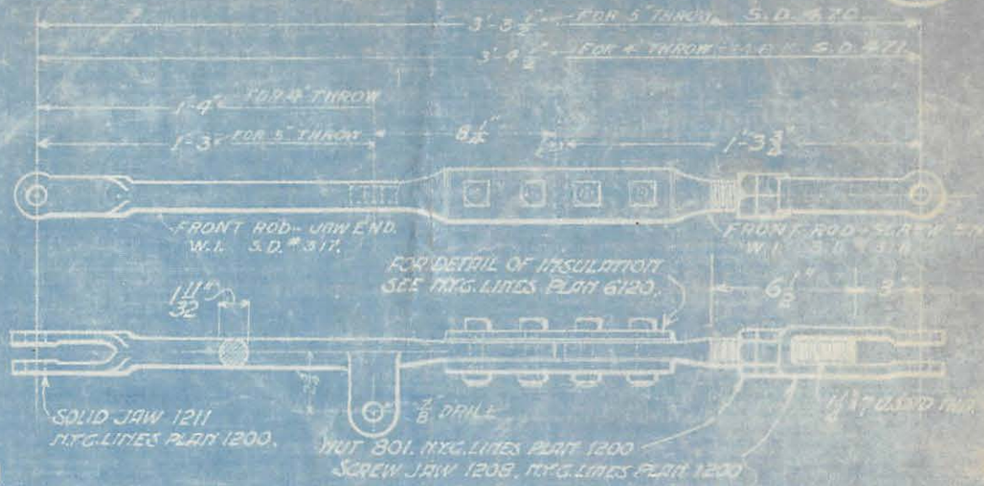
DEPT. APR 30 1928 U.S.

12-20-05 W.H.E.

X-37 REVISION No. 3

FRONT ROD COMPLETE FOR 5" THROW
W.I. S.D. 468.




3'-3 1/2" FOR 5" THROW S.D. 470
3'-4 1/2" FOR 4" THROW M.P.F. S.D. 471
1'-4" FOR 4" THROW
1'-3" FOR 5" THROW
8 1/2"
1'-3 1/2"
FRONT ROD-JAW END W.I. S.D. #317
FRONT ROD-SCREW END W.I. S.D. #318
FOR DETAIL OF INSULATION SEE N.Y.C. LINES PLAN 6120.
1 11/32"
6 1/2"
3"
SOLID JAW 1211 N.Y.C. LINES PLAN 1200.
7/8" DRILL
1 1/4" U.S.STD. THD.
NUT 801, N.Y.C. LINES PLAN 1200
SCREW JAW 1208, N.Y.C. LINES PLAN 1200

N.Y.C.R.R.

SIGNAL DEPARTMENT.

SPECIAL FRONT RODS.

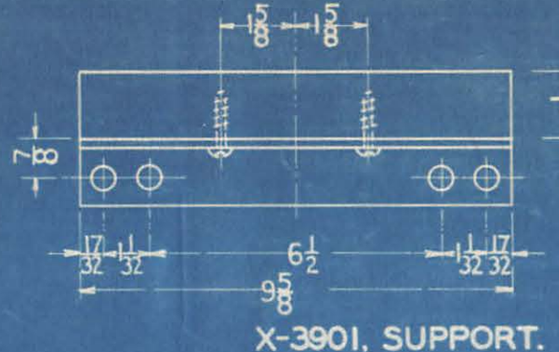
FOR INSULATED DOUBLE SLIP.

SCALE 1½"=1'-N.Y.-5-27-05-H.E.

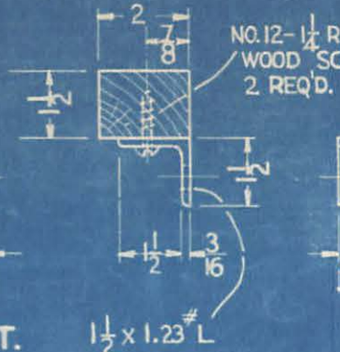
W.H. Elliott
SIGNAL ENGINEER.

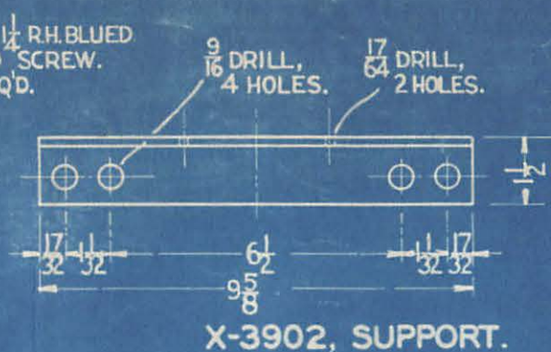
X-39

7-31-31

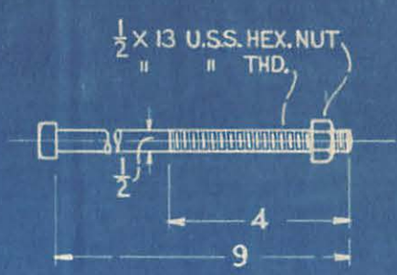


X-3901, SUPPORT.

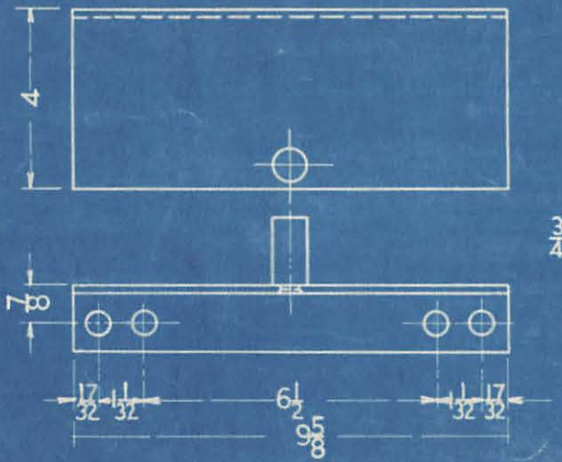




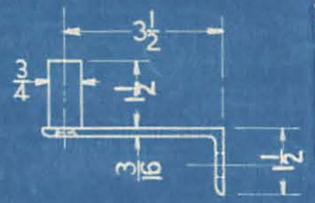
X-3902, SUPPORT.

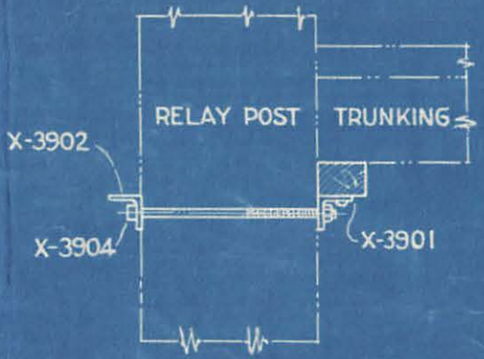


X-3904, STUD.



X-3903, SUPPORT.





ASSEMBLY-1 SHOWN.

NOTE: ALL METAL PARTS SHALL BE GALVANIZED OR CADMIUM PLATED.

0 3 6 9 12

SCALE OF INCHES

ASSEMBLY-1		ASSEMBLY-2		ASSEMBLY-3		ASSEMBLY-4		ASSEMBLY-5	
REF. NO.	NO. REQ'D.	REF. NO.	NO. REQ'D.	REF. NO.	NO. REQ'D.	REF. NO.	NO. REQ'D.	REF. NO.	NO. REQ'D.
X-3901	1	X-3901	1	X-3901	2	X-3903	2	X-3901	1
X-3902	1	X-3903	1	X-3904	4	X-3904	2	X-3903	1
X-3904	2	X-3904	2					X-3904	2

N. Y. C. R. R.

SIGNAL DEPARTMENT

TRUNKING SUPPORT

ALBANY, JULY 31 - 1931.

W. H. Elliott 10/10/31.

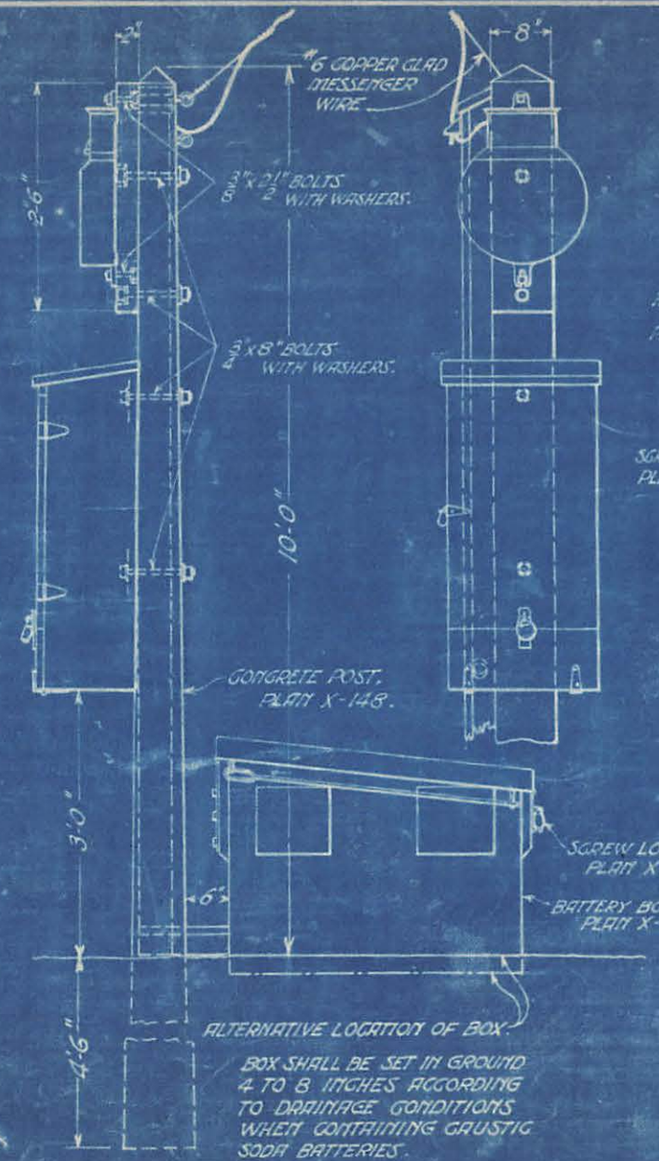
SIGNAL ENGR.

DEPT. OF AGR.
OCT 19 1931
U. S.

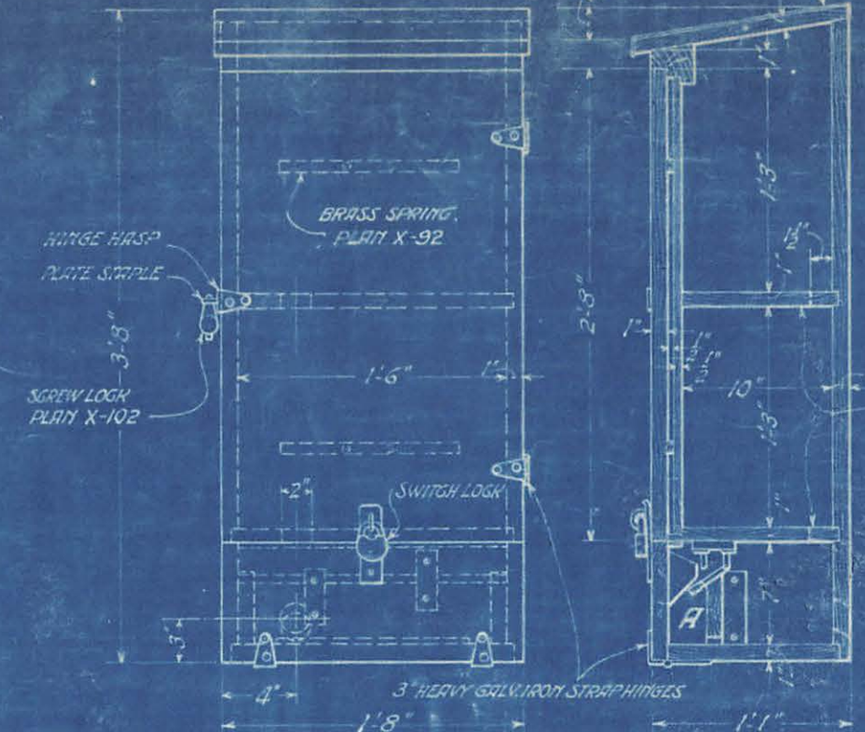
OCT 19 1931
A. M.
NOTE ATTENTION
Ans'd
Date

X-64
REV. 5

1-30-18

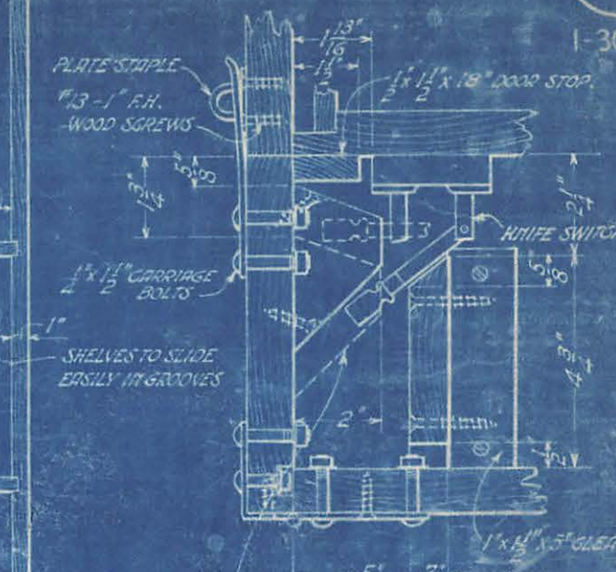


SCALE 1/2" = 1'-0"



RELAY BOX, WITHOUT LOCKS. X-6401.
1"=1'-0".

DETAIL OF BLOCK.
1 REQUIRED FOR EACH SWITCH.
SCALE: 3" = 1'-0"



DETAIL AT "A".
3"=1'-0".

DOTTED LINE SHOWS LOCATION OF BLOCK FOR NORMALLY CLOSED SWITCH.

NOTE: HINGES SHALL BE FASTENED WITH 4 CARRIAGE BOLTS WITH NUTS INSIDE AND 4 1" #13 F.H. WOOD SCREWS. HINGE HASP TO BE FASTENED WITH 2 CARRIAGE BOLTS AND 1" #13 WOOD SCREWS.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

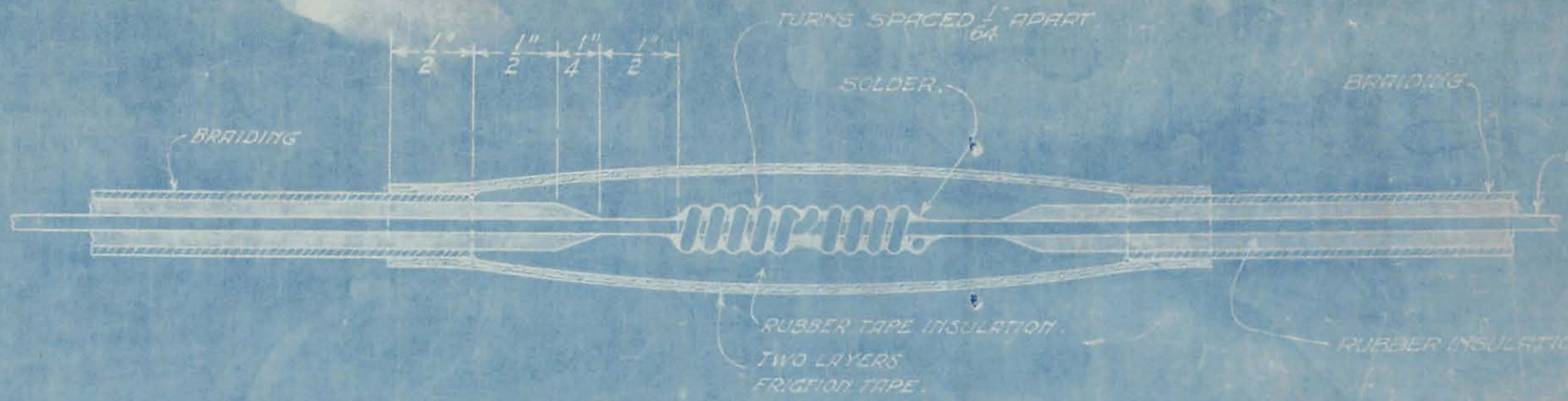
GROSSING BELL SET.

SCALES INDICATED. ALBANY, MAY 12TH 1916.

W.H. Elliott 5/13/16.

SIGNAL ENGINEER.

X-76
REV.
2



NOTE: COVERING OF JOINT SHALL BE IN ACCORDANCE WITH SPECIFICATIONS 2 53.

N.Y.C.R.R.

SIGNAL DEPARTMENT

RUBBER INSULATED WIRE JOINT.

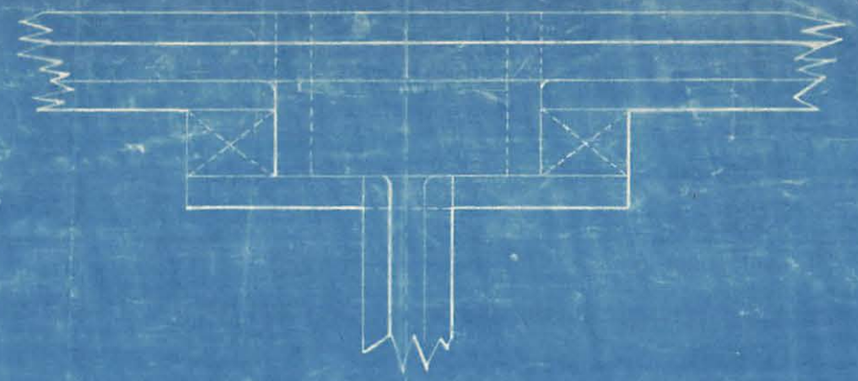
NEW YORK, JAN 21-09

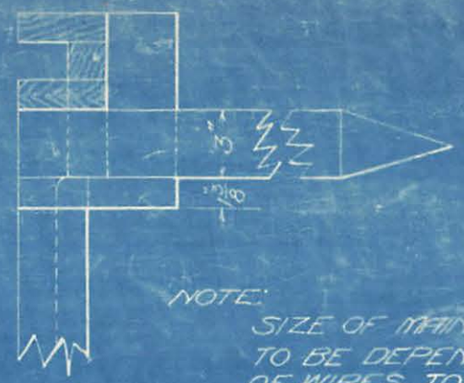
Wm. Elliott
SIGNAL ENGINEER

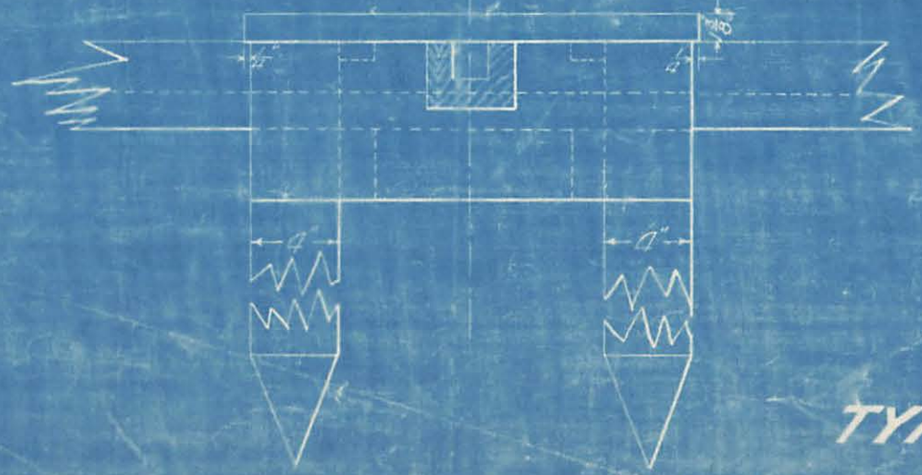
REC'D
JUN
8
1915
THE U. S. & S. CO.
BLUE BELL, PA.

JUN 8 '15
U.S.&S.CO.

X-78







NOTE:

SIZE OF MAIN AND BRANCH TRUNKING TO BE DEPENDENT UPON THE NUMBER OF WIRES TO BE RUN.

INSIDE CLEARANCE OF JUNCTION BOX TO BE THREE TIMES THE INSIDE WIDTH OF TRUNKING RUN, AND NOT LESS THAN 6 INCHES NOR MORE THAN 12 INCHES IN WIDTH UNLESS ALLOWED BY THE ENGINEER.

STAKES TO BE OF OAK-ROUGH. TRUNKING AND BOXING TO BE OF FIRST QUALITY CYPRESS FINISHED 4 SIDES.

N.Y.C.&H.R.R.R.

SIGNAL DEPARTMENT, EXTERIOR ZONE

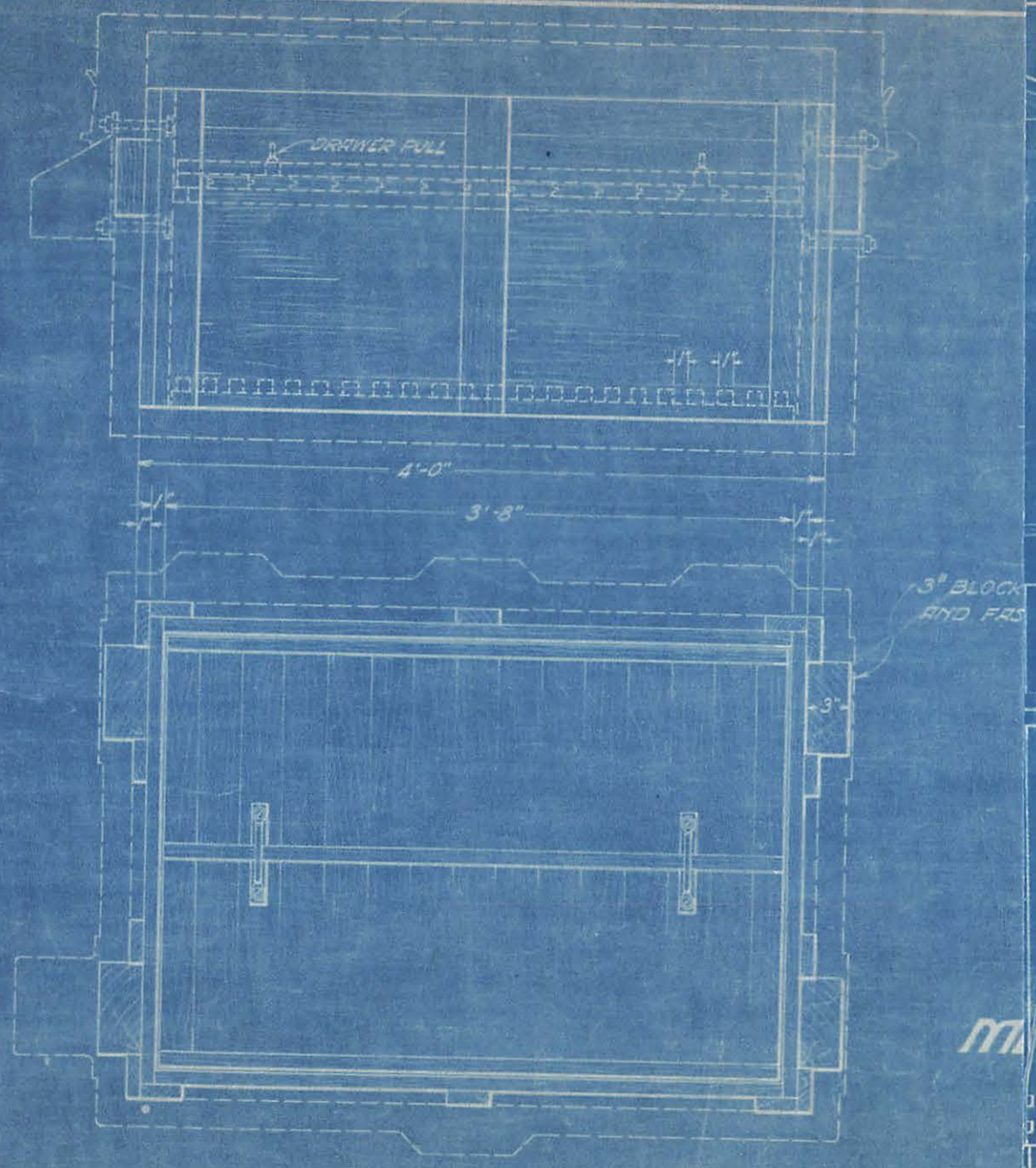
TYPICAL TRUNKING JUNCTION BOX.

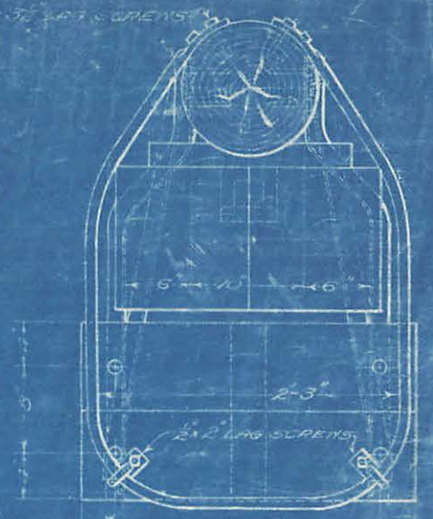
SCALE 1 in. = 1 ft. NEW YORK, FEB. 28 '08

Wm. H. Elliott. 3/1/08.

SIGNAL ENGINEER.

X-88





2"x8"x2'6" YELLOW PINE

1"x3"x16" WOOD CLEAT NAILED TO PLATFORM

N. Y. C. & H. R. R. R.

SIG. DEPT - EXTERIOR ZONE.

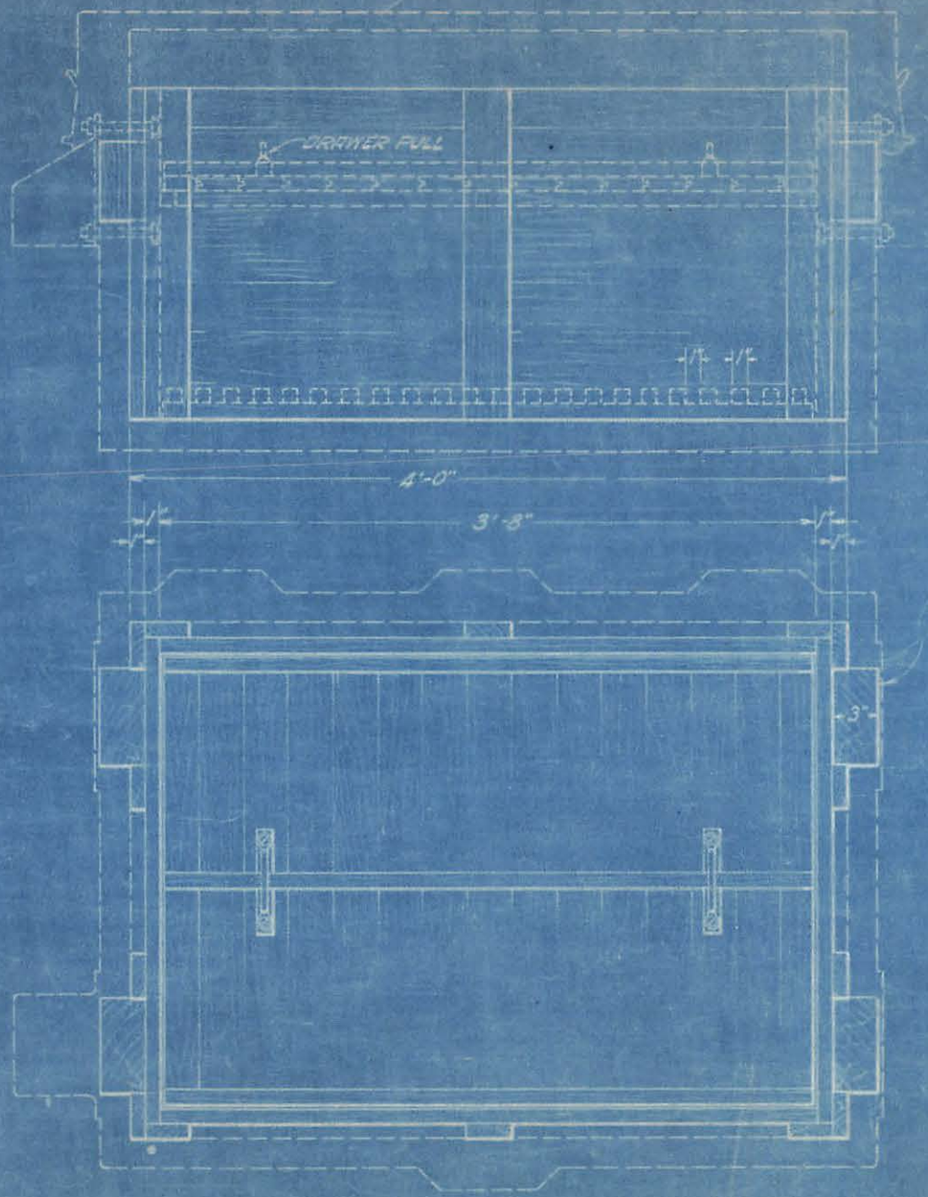
PLATFORM ON TELEGRAPH POLE, FOR JUNCTION BOX.

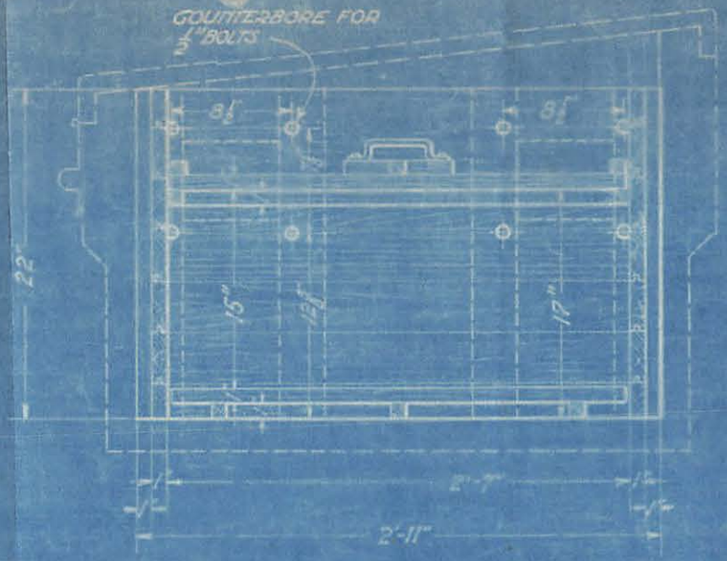
SCALE 3/4" = 1'-0"

NEW YORK NOV. 10-08 J. M. S. G.

W. H. Elliott 11/10/08

SIGNAL ENGINEER.





X-81
Rev. 4

4-3-17

3" BLOCKS FITTED SNUGLY INTO ALL 4 OPENINGS AND FASTENED TO LINING.

S.D. 810 - CONCRETE BATTERY BOX WITH WOOD LINING				
No. REQ'D	NAME	REF. NO	PLAN NO	
1	WOOD LINING COMPLETE	S.D. 811	X - 81	
1	CONCRETE BATTERY BOX ONLY	S.D. 812	X - 131	

NOTE:- HOLES FOR BATTERY LEADS SHALL BE BORED THROUGH FILLER BLOCK AND SHALL BE BORED IN WOOD LINING BELOW FROST BOARD. THE LOCATION AND SIZE OF HOLES SHALL BE DETERMINED IN THE FIELD.

N. Y. C. R. R.

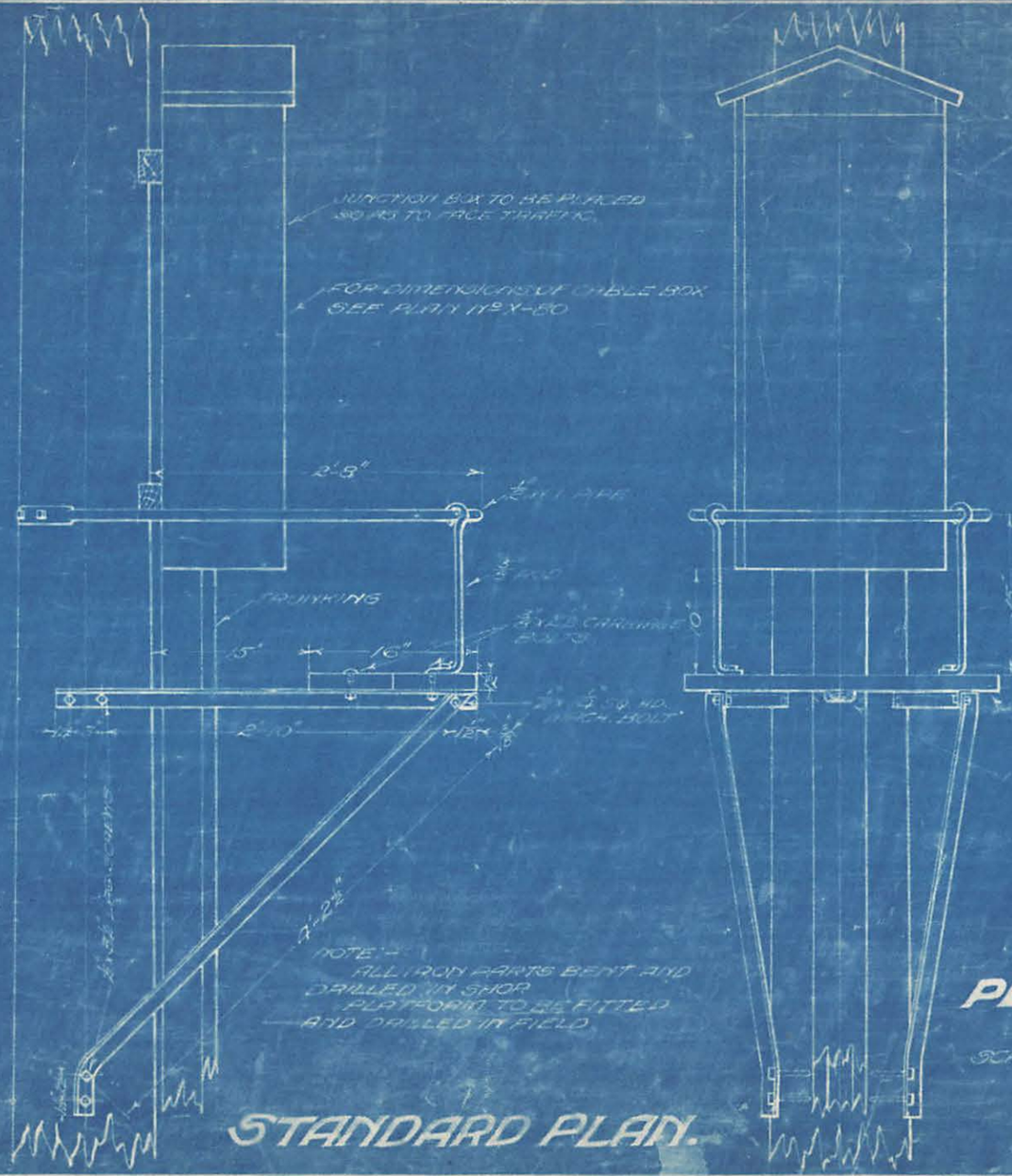
SIGNAL DEPT.

MEDIUM CONCRETE BATTERY BOX LINING

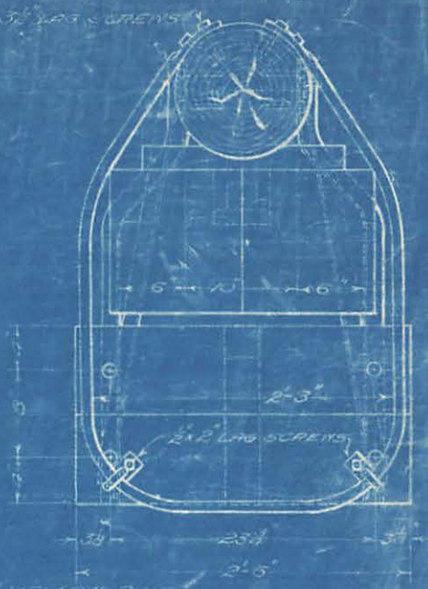
SCALE: 1" = 1'-0". ALBANY OCT. 7, 1913.

W. H. Elliott 10/11/13
SIGNAL ENG'R.

X-88


JUNCTION BOX TO BE PLACED SO AS TO FACE TRACK K.
FOR DIMENSIONS OF CABLE BOX SEE PLAN No X-50
2'-8"
3/4" I. PIPE
3/4" ROD
TRUNKING
5"
16"
3/4" x 2½ CARRIAGE BOLTS
3/4" x 5'-0" RD. IRON BOLT
2'-10"
1/2"
1/2"
4'-2½"
NOTE:- ALL IRON PARTS BENT AND DRILLED IN SHOP PLATFORM TO BE FITTED AND DRILLED IN FIELD

STANDARD PLAN.



2½" x 8" x 8'-6" YELLOW PINE

1" x 3" x 16" WOOD CLEAT NAILED TO PLATFORM

N. Y. C. & H. R. R. R.

SIG. DEPT. - EXTERIOR ZONE.

PLATFORM ON TELEGRAPH POLE, FOR JUNCTION BOX.

SCALE: ½" = 1'-0" NEW YORK NOV. 10-08 J. M. S. G.

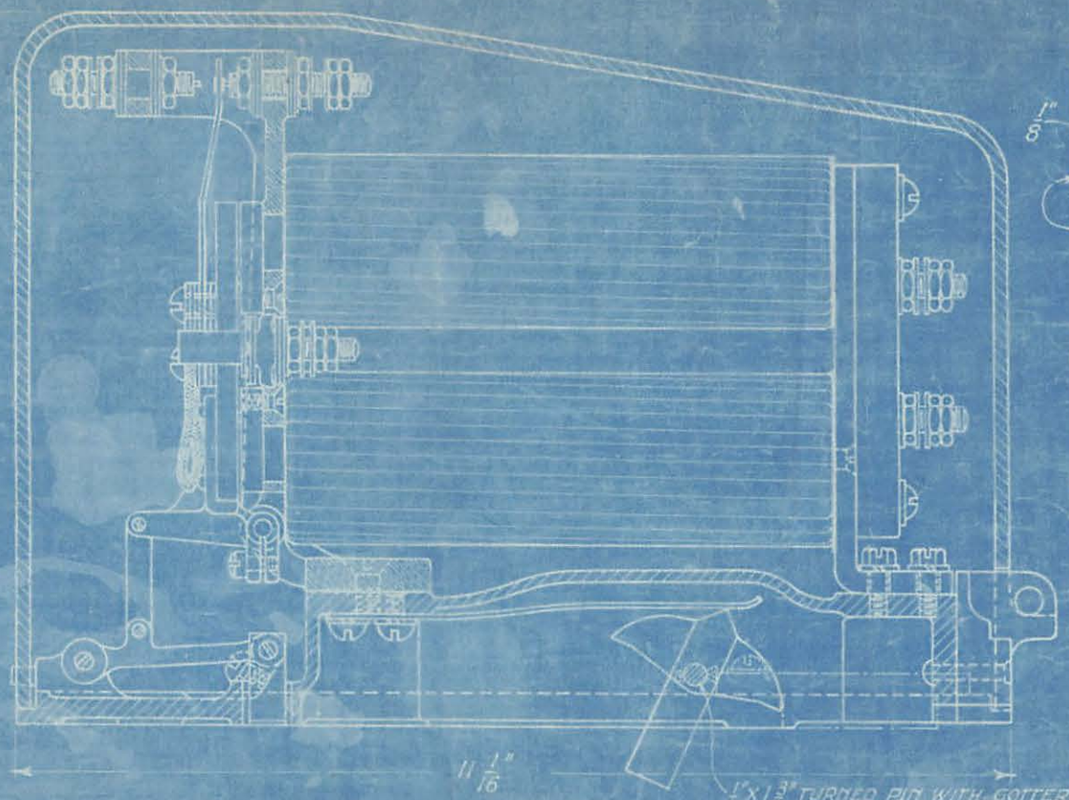
W. H. Elliott. "11/10/08.

SIGNAL ENGINEER.

X-90
REV. 3

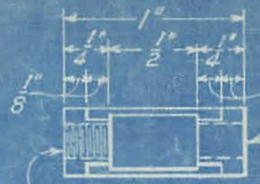
A-B 16

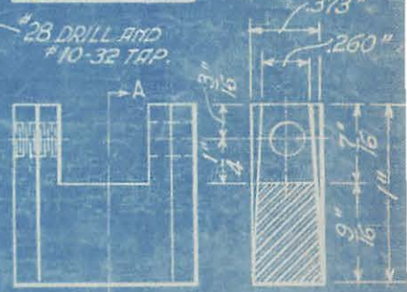
CONTACTS NOT TO BE FURNISHED UNLESS SPECIFIED.



WOUND TO 500 OHM RESISTANCE.

STOPS IN END OF MAGNET CORE MUST PROJECT FROM SURFACE OF SAME NOT LESS THAN ONE-FIFTIETH (1/50) OF AN INCH.





SECTION A-A.

DOG, CASE HARDENED.
SCALE: FULL SIZE.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

ELECTRIC LOCK FOR PNEUMATIC SWITCH LEVER

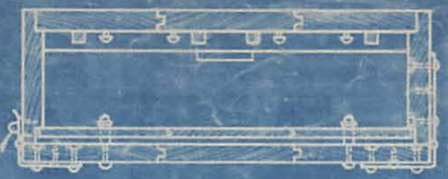
SCALE: HALF SIZE. NEW YORK, OCT. 20. 08

W. H. Elliott 12/20/08

SIGNAL ENGINEER.

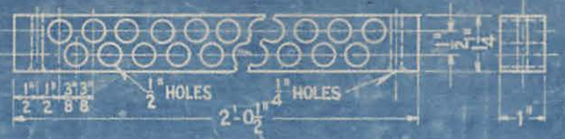
SPECIFICATION DEPT
APR 20 '76

X-92
REV.
11
5-25-23



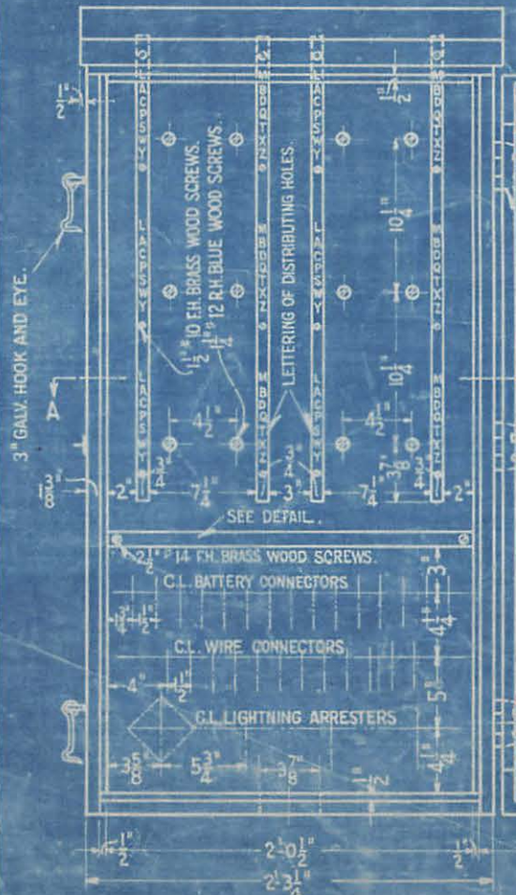
SECTION AA
WITH DOOR CLOSED.

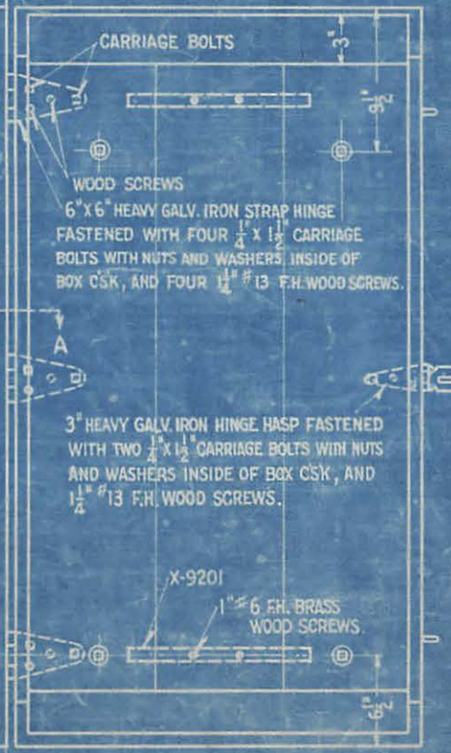
GALV. PLATE STAPLE FASTENED WITH $1\frac{1}{4}$" #13 F.H. WOOD SCREWS.

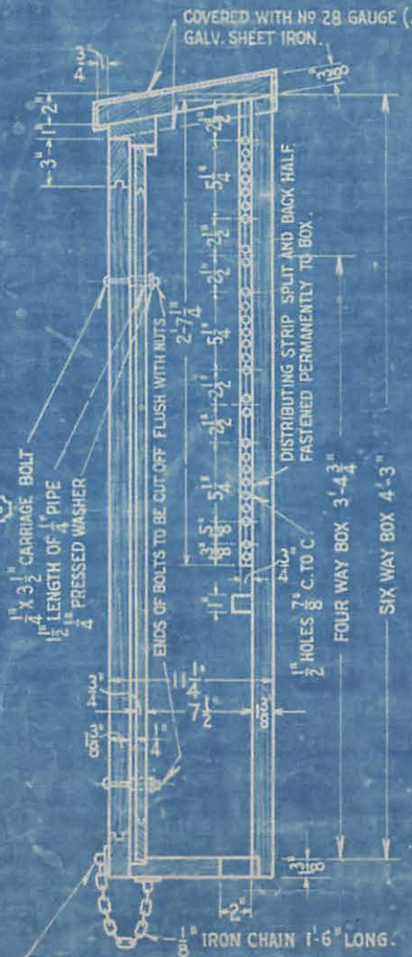


HORIZONTAL DISTRIBUTING STRIP
SCALE : 3"=1'-0"

X-9201, BRASS SPRING.
2 REQ'D.




CARRIAGE BOLTS
WOOD SCREWS
6"X6" HEAVY GALV. IRON STRAP HINGE FASTENED WITH FOUR ¼" X 1½" CARRIAGE BOLTS WITH NUTS AND WASHERS INSIDE OF BOX CSK, AND FOUR 1¼" #13 F.H. WOOD SCREWS.
3" HEAVY GALV. IRON HINGE HASP FASTENED WITH TWO ¼" X 1½" CARRIAGE BOLTS WITH NUTS AND WASHERS INSIDE OF BOX CSK, AND 1¼" #13 F.H. WOOD SCREWS.
X-9201
1" #6 F.H. BRASS WOOD SCREWS.


COVERED WITH No 28 GAUGE (.0156") GALV. SHEET IRON.
¼" X 3½" CARRIAGE BOLT
1½" LENGTH OF ¼" PIPE
PRESSED WASHER
ENDS OF BOLTS TO BE CUT OFF FLUSH WITH NUTS.
DISTRIBUTING STRIP SPLIT AND BACK HALF FASTENED PERMANENTLY TO BOX.
½" HOLES 7" C. TO C.
FOUR WAY BOX 3'-4¾"
SIX WAY BOX 4'-3"
⅛" IRON CHAIN 1'-6" LONG.
PLATE STAPLES FASTENED WITH 1¼" #13 F.H. WOOD SCREWS.

NOTES: BOX SHALL BE MADE OF WHITE PINE DRESSED, WITH JOINTS AS SHOWN LAID IN WHITE LEAD AND NAILED WITH BARBED COMMON NAILS CSK.

DISTRIBUTING STRIPS SHALL BE MADE OF MAPLE, MARKED WITH ⅜" LETTERS CUT IN WITH DIES AND GIVEN 2 COATS OF VARNISH.

BOX SHALL BE PAINTED INSIDE 2 COATS WHITE, OUTSIDE 2 COATS BLACK.

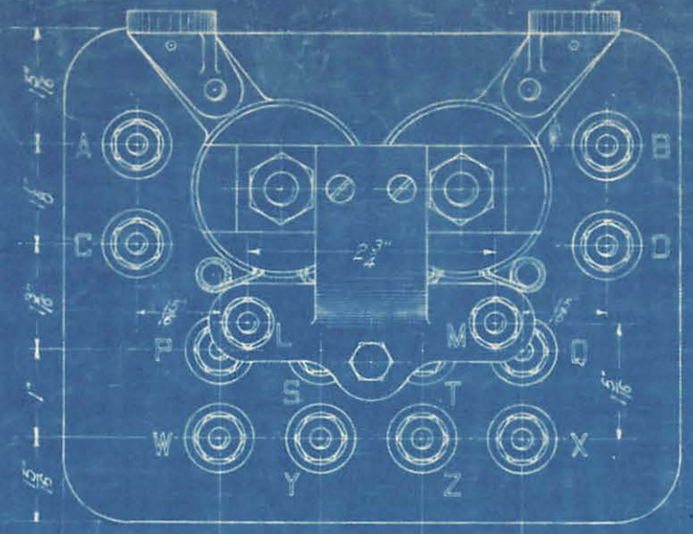
NAIL HOLES SHALL BE PUTTIED AFTER FIRST COAT OF PAINT IS APPLIED.

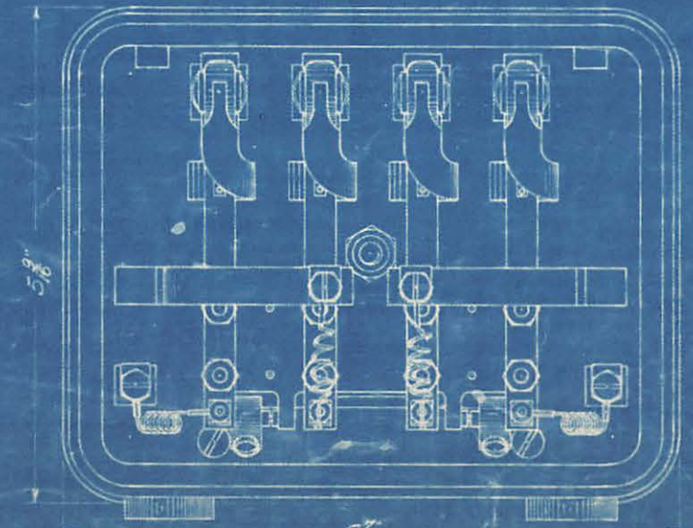
X-9202 - FOUR WAY RELAY BOX COMPL.
X-9203 - SIX " " " "

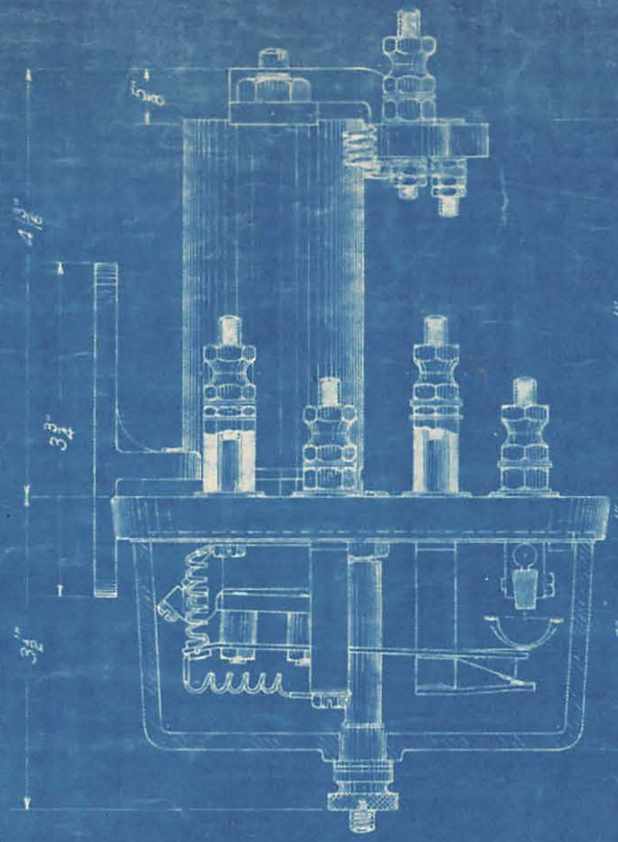
N.Y.C.R.R.
SIGNAL DEPARTMENT
RELAY BOX
SCALE 1"=1'-0" ALBANY, SEPT. 30, 1919.

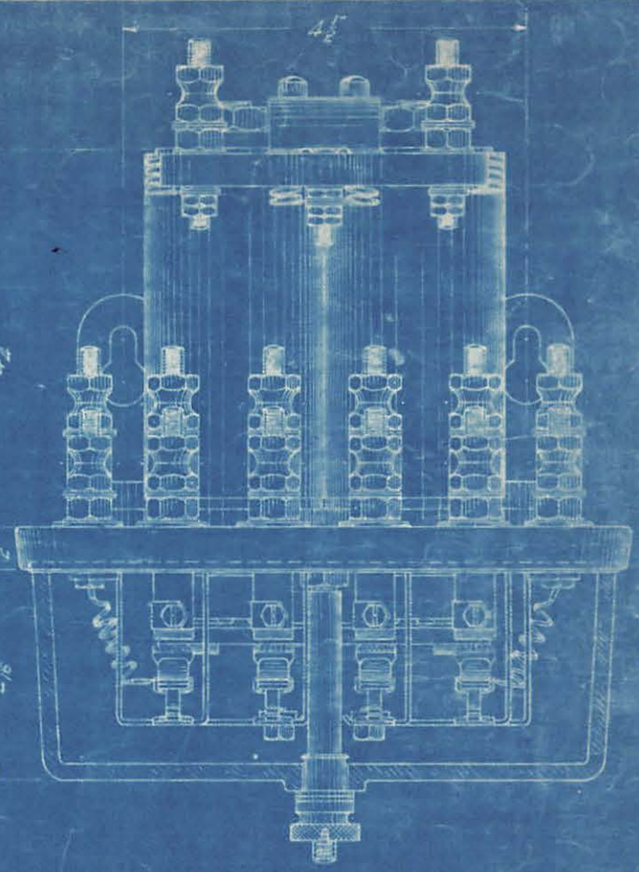
W. H. Elliott 10/3/19
SIGNAL ENGINEER.

X-95
REV. 2









N. Y. C. & H. R. R. R.

SIGNAL DEPARTMENT

WALL TYPE RELAY.

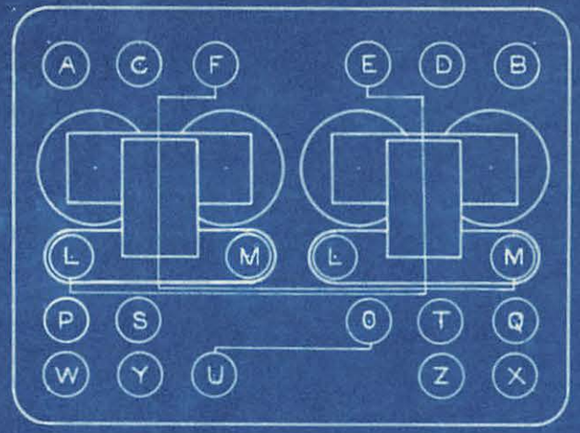
RESISTANCE AS REQUIRED

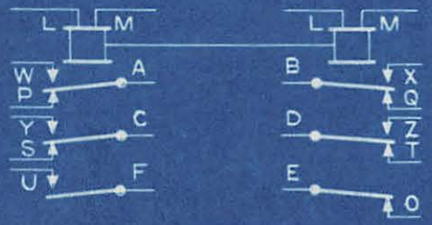
SCALE 6"=1'-0" ALBANY OCT. 15, 1913.

W. H. Elliott 10/22/13
SIGNAL ENGR.

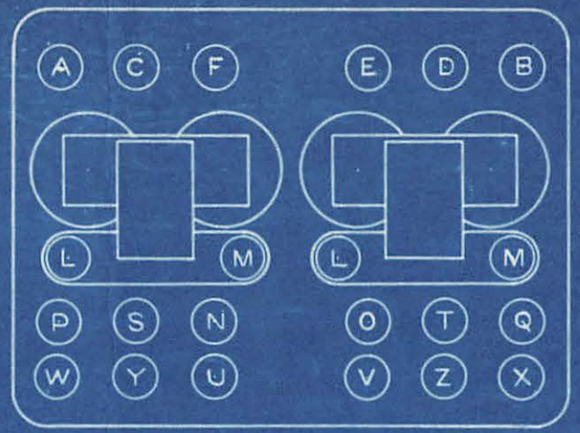
X-97
REV. 5
6-17-30

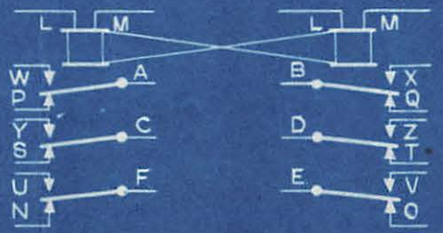
FLASHER RELAY



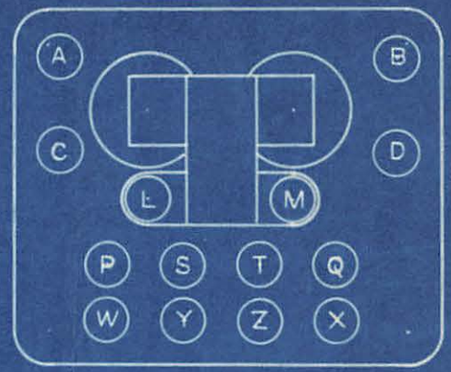


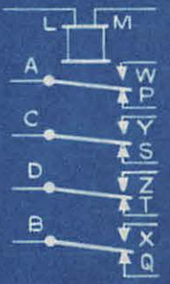
INTERLOCKING RELAY





NEUTRAL RELAY, TYPE-H





N. Y. C. R. R.

SIGNAL DEPARTMENT

D.C. RELAY TERMINAL DESIGNATIONS

ALBANY JUNE 16, 1908.

W. H. Elliott 4/14/30.

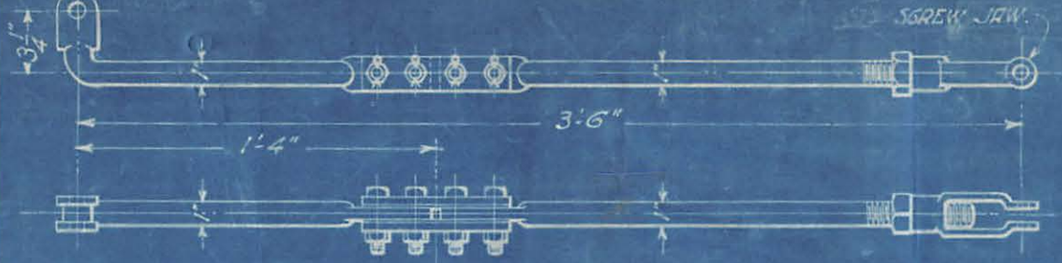
SIGNAL ENGR.

DEPT. DEC 5 1930

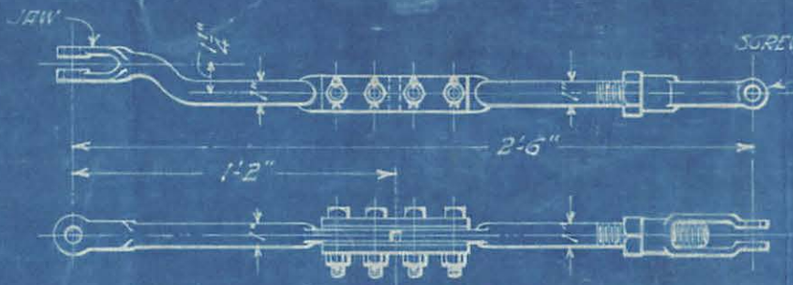
NOTE: CONNECTING RODS 4 FT. OR LESS IN LENGTH SHALL BE OF NOT LESS THAN 1" ROUND IRON. RODS OVER 4 FT. IN LENGTH SHALL BE OF 1 1/32" ROUND IRON WITH JAWS AS PER N.Y.C. LINES PLAN 1200 DRILLED FOR 5/8" PINS AND MODIFIED TO FIT CRANKS. INSULATION SHALL BE AS PER N.Y.C. LINES PLAN 6120. RODS SHALL BE PROPERLY SUPPORTED EVERY 3 FT. AND SHALL BE AS STRAIGHT AS POSSIBLE WITH NECESSARY OFFSETS OBTAINED BY SHORT CURVES IN END OF ROD.

X-98
REV. 5

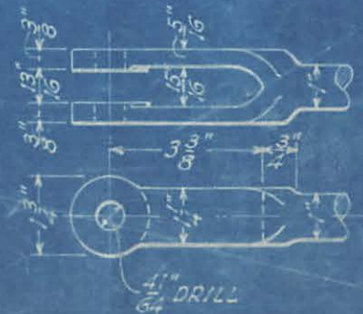
9-14-15



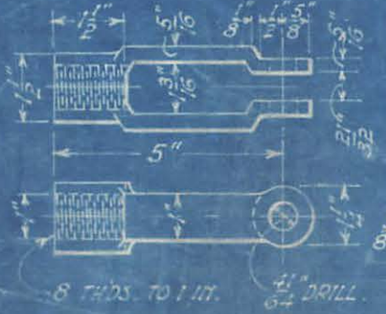
S.D. 669.



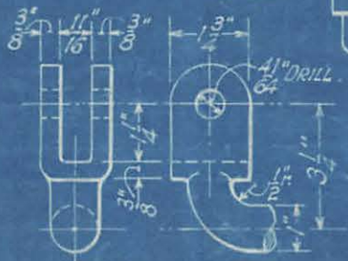
S.D. 670.



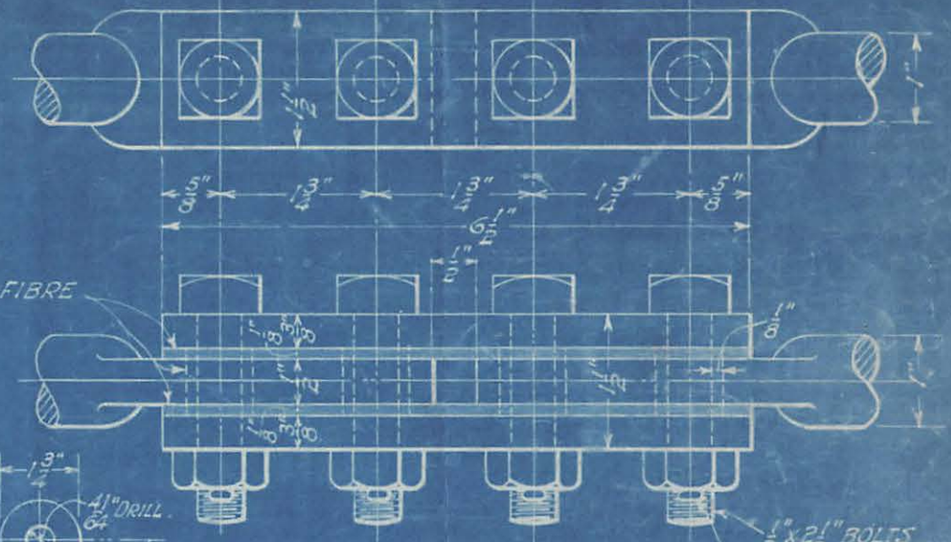
SOLID JAW, FOR S.D. 670.



SCREW JAW, FOR S.D. 669 & 670.



SOLID JAW, FOR S.D. 669.



DETAIL OF INSULATION.

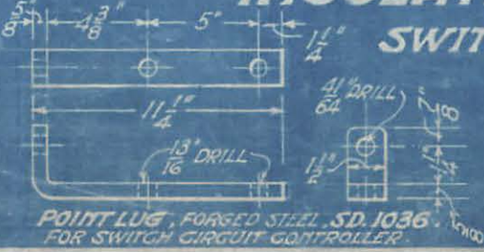
N.Y.C.R.R.

SIGNAL DEPARTMENT.

INSULATED CONNECTING RODS.

SWITCH CIRCUIT CONTROLLERS.

ALBANY, MARCH 23, 1912.



POINT LUG, FORGED STEEL. S.D. 1036. FOR SWITCH CIRCUIT CONTROLLER.

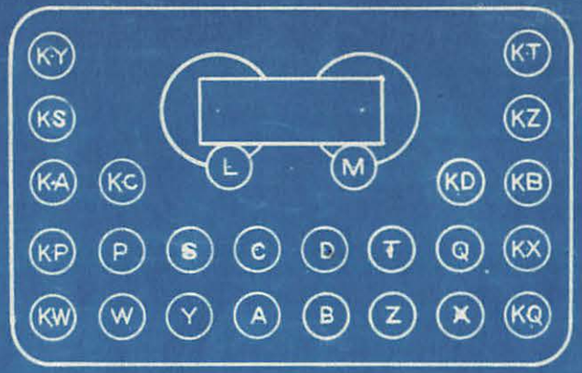
W. H. Elliott. 3/23/12.

SIGNAL ENGINEER.

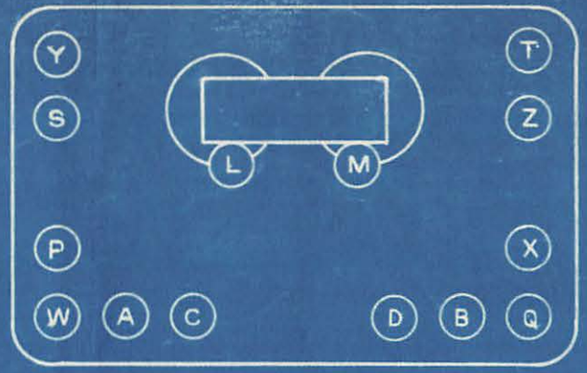
X-101

4-4-30

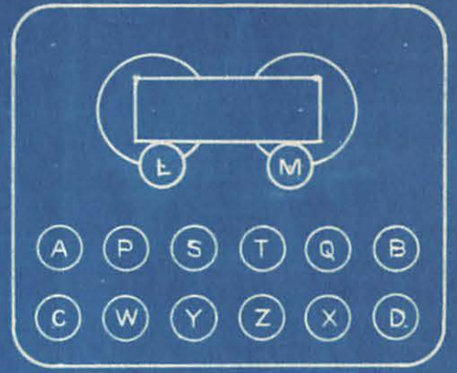
POLARIZED, TYPE-K, CLASS-C

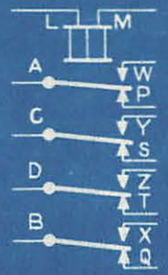


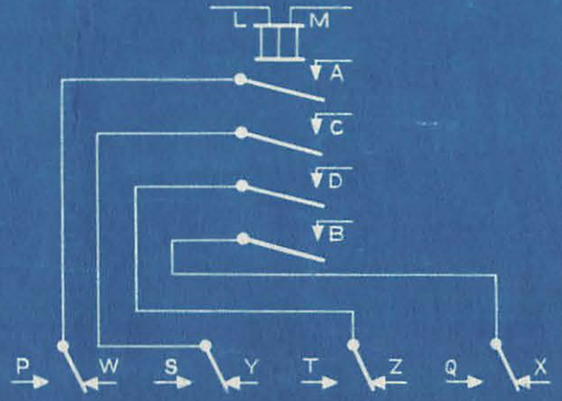
POLARIZED, TYPE-K, CLASS-SS

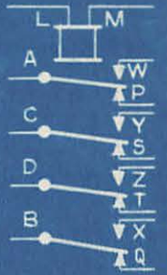


NEUTRAL, TYPE-K









N. Y. C. R. R.

SIGNAL DEPARTMENT

TYPE K, D.C. RELAY TERMINAL DESIGNATIONS

ALBANY APRIL 4, 1930.

W.H. Elliott 4/4/30

SIGNAL ENGR.

EHD

X-105
REV. 2
5-25-15

FIRST POSITION

BRAIDING

FINISHED JOINT

RUBBER TAPE INSULATION.

NOTE.-

WIRES TO BE TINNED BEFORE JOINT IS MADE. TURNS TO BE SPACED 1/16" APART.

AFTER TWISTING TOGETHER THE JOINT MUST BE SOLDERED BY DIPPING THE WIRES IN OR POURING ON THE MELTED SOLDER.

COVERING OF JOINT SHALL BE IN ACCORDANCE WITH SPECIFIGATIONS # 2-53.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

WEATHERPROOF INSULATED IRON WIRE JOINT

ALBANY, MAY 7-10.

W. H. Elliott 9/13/10.

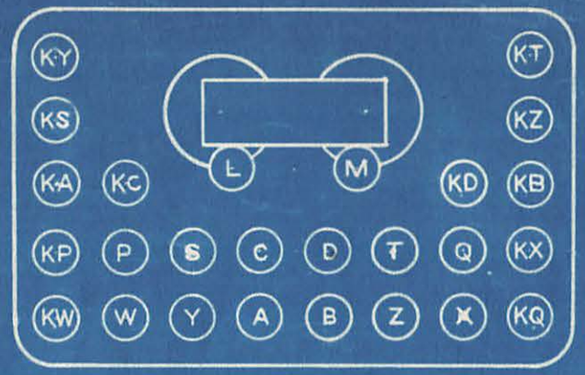
SIGNAL ENGINEER.

RECD
APR
9
1917

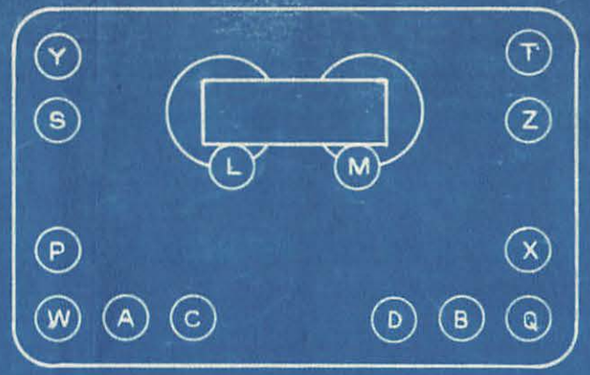
X-101

4-4-30

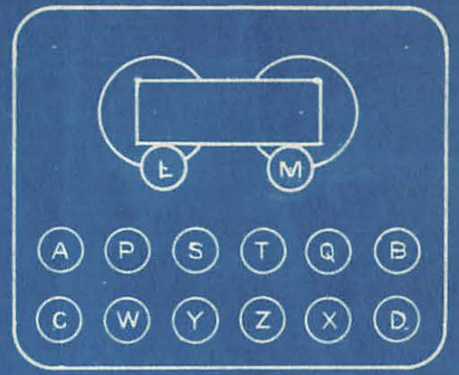
POLARIZED, TYPE-K, CLASS-C

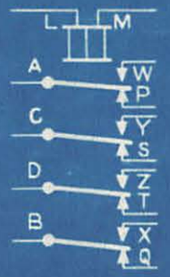


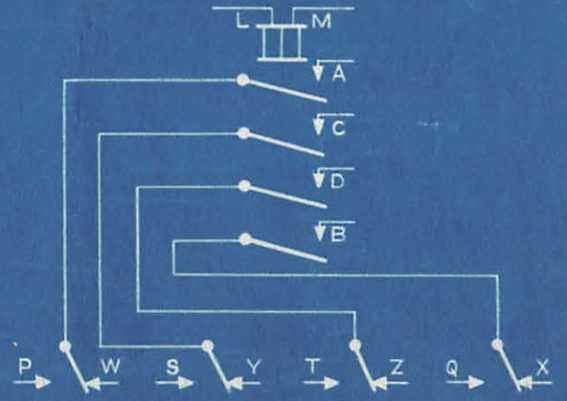
POLARIZED, TYPE-K, CLASS-SS

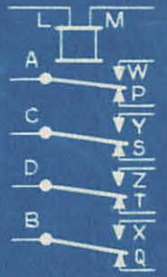


NEUTRAL, TYPE-K









N. Y. C. R. R.

SIGNAL DEPARTMENT

TYPE K, D.C. RELAY TERMINAL DESIGNATIONS

ALBANY APRIL 4, 1930.

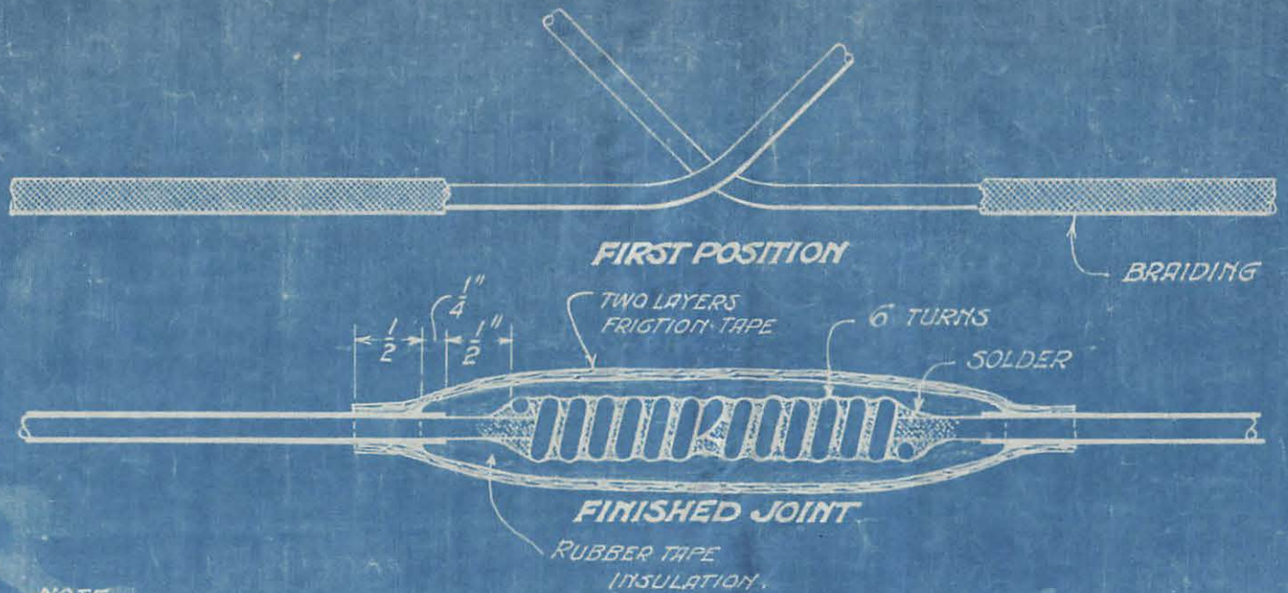
W.H. Elliott 4/4/30

SIGNAL ENGR.

EMD

X-105
REV.
2

5-25-15



NOTE.-

WIRES TO BE TINNED BEFORE JOINT IS MADE. TURNS TO BE SPACED 1/16" APART.

AFTER TWISTING TOGETHER THE JOINT MUST BE SOLDERED BY DIPPING THE WIRES IN OR POURING ON THE MELTED SOLDER.

COVERING OF JOINT SHALL BE IN ACCORDANCE WITH SPECIFIGATIONS # 2-53.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

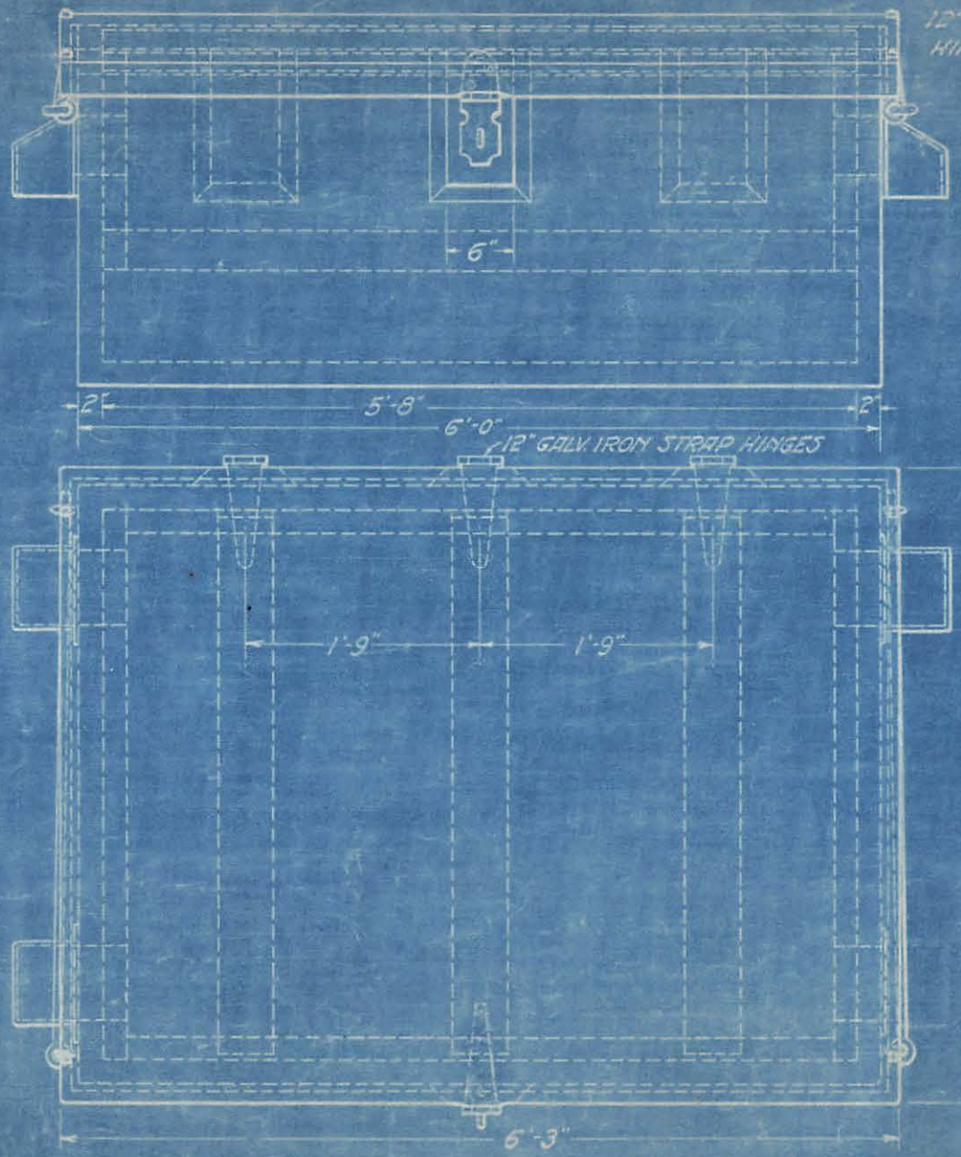
WEATHERPROOF INSULATED IRON WIRE JOINT

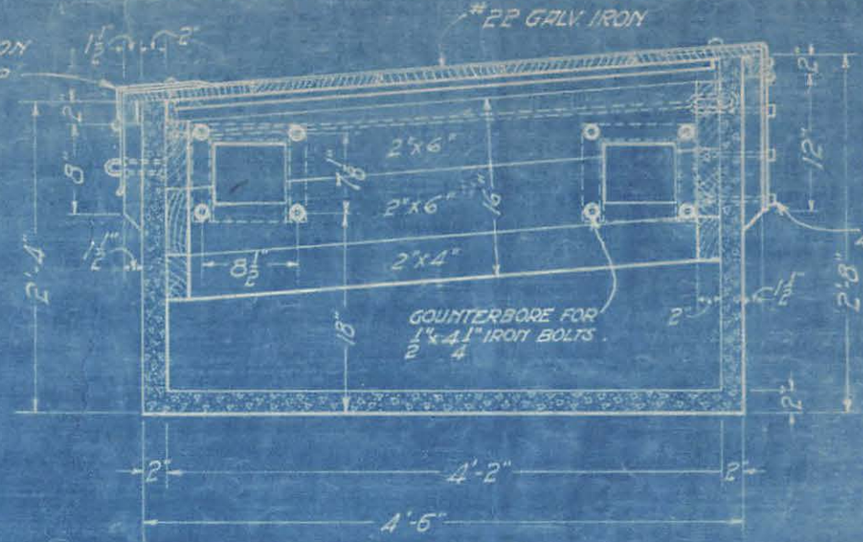
ALBANY, MAY 7-10.

W. H. Elliott 9/13/10.

SIGNAL ENGINEER.

X-108
REV. 8
4-3-17





CONCRETE BATTERY BOX WITH 16" TERMINAL BOARD, S.D. 820.

CONCRETE BATTERY BOX WITH 12" TERMINAL BOARD, S.D. 956.

CONCRETE BATTERY BOX WITHOUT TERMINAL BOARD, S.D. 821.

TERMINAL BOARD, S.D. 822.

NOTE: FOR DETAILS OF FITTINGS SEE PLAN X-113. BOX S.D. 821 SHALL BE EQUIPPED WITH 3 OUTLET CAPS, 1 PIECE OF COPPER WIRE CLOTH FOR OUTLET, AND ONE OUTLET COVER. LOCATION OF OUTLET CAPS AND COVER SHALL BE DETERMINED IN THE FIELD.

N. Y. C. R. R.

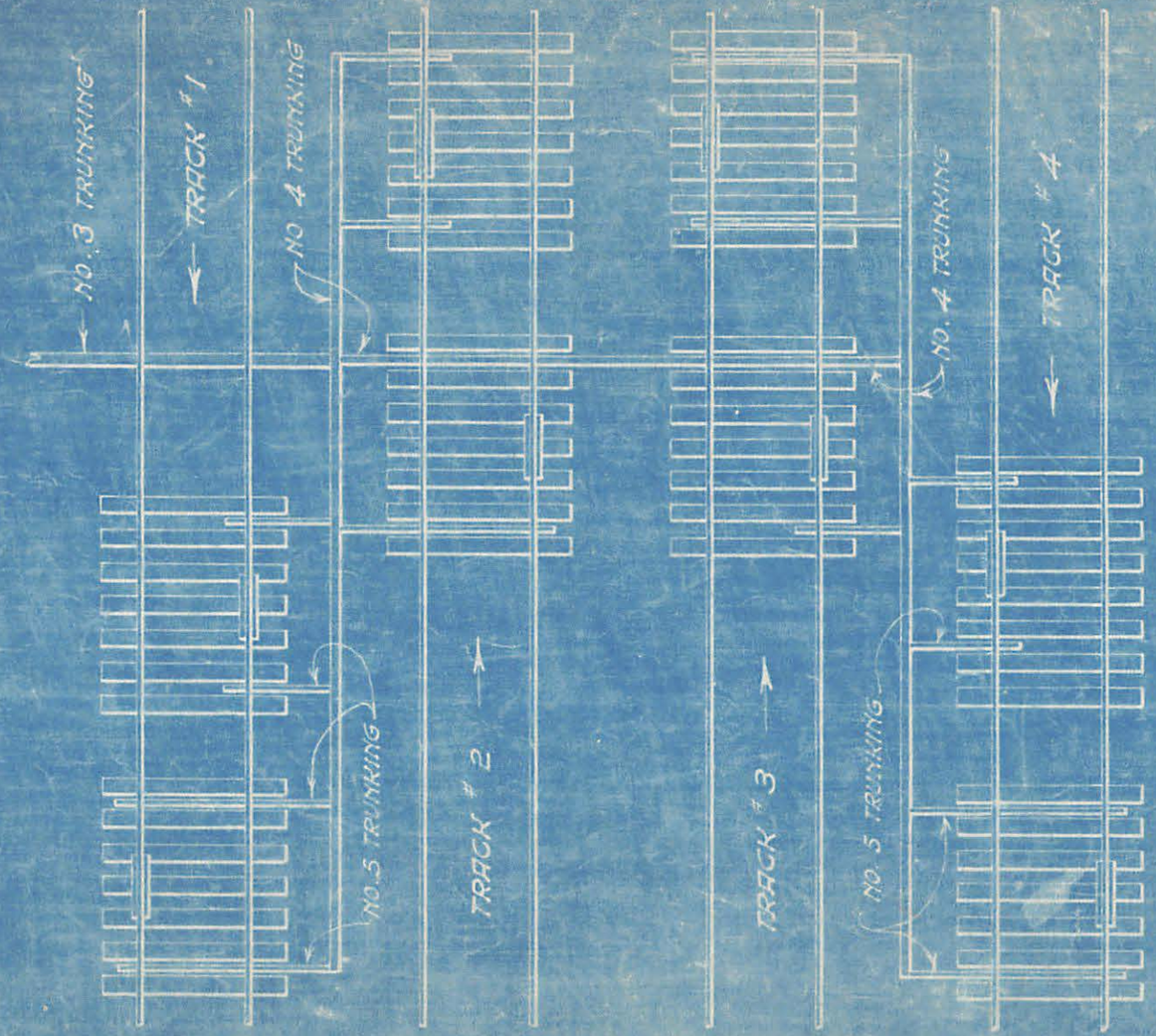
SIGNAL DEPARTMENT

LARGE CONCRETE BATTERY BOX

SCALE: 3" = 1'-0". ALBANY, NOV. 14' 1912.

W. H. Elliott
SIGNAL ENGINEER

X-109



NOTE: THIS ARRANGEMENT FOR AUTOMATIC SIGNALS AND CUT SECTIONS ONLY.

NOTE: WHERE TRUNKING IS PLACED BETWEEN TRACKS IT WILL BE LAID WITH BOTTOM OF CAPPING EVEN WITH THE TOP OF BALLAST.
FOR TRUNKING SPECIFICATIONS, SEE PLANS X-45 & Z-46.

N.Y.C & H.R.R.R.
B. & A.R.R.
SIGNAL DEPARTMENT.

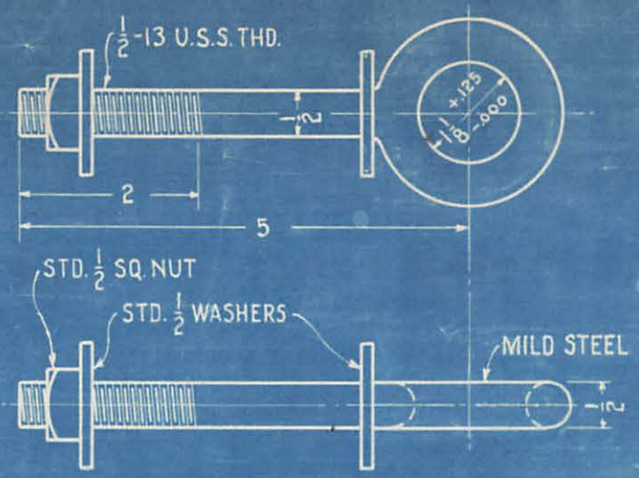
TRUNKING LOCATION.
FOUR TRACK AUTO. SIGNAL ARRANGEMENT.

SCALE 1" = 8' ALBANY, MARCH 8-10.

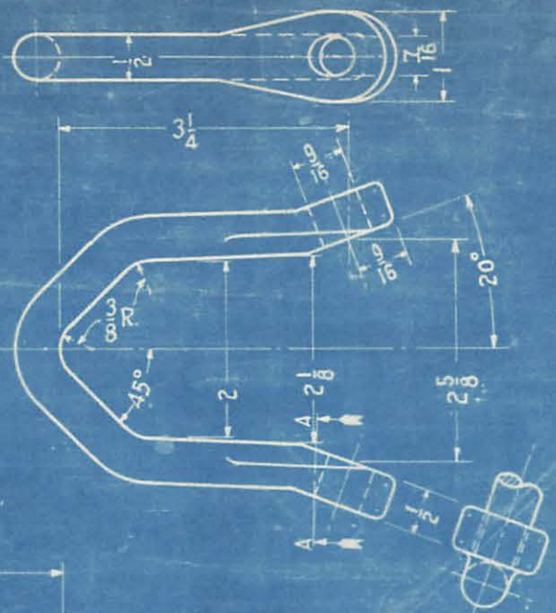
W. H. Elliott 3/10/10.
SIGNAL ENGINEER.

X-III

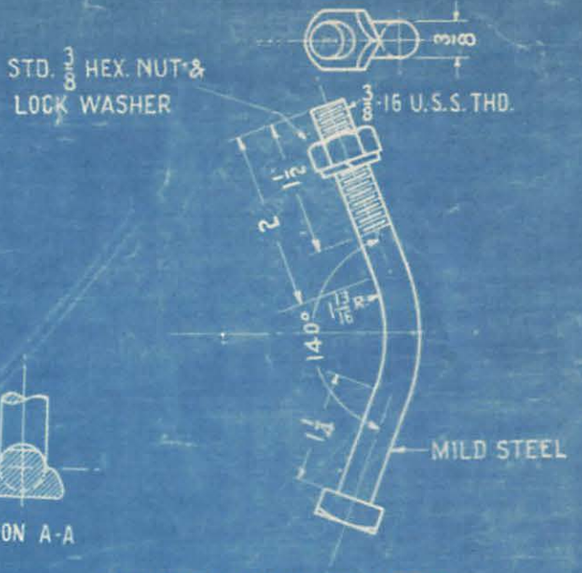
1-11-'24



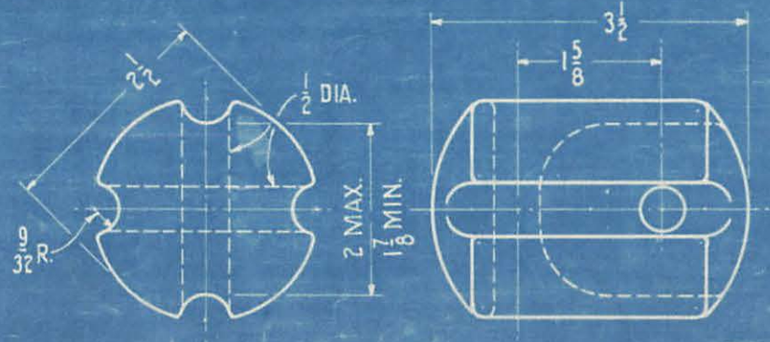
X-11102 EYE BOLT COMPLETE
GALV. AFTER TH'D. IS CUT.



SECTION A-A



X-11104 BOLT COMPLETE
GALV. AFTER TH'D. IS CUT.



X-11101 INSULATOR, PORCELAIN, GLAZED.

X-11103 CLEVIS ONLY, M.I., GALV.
X-11105 CLEVIS COMPLETE
WITH BOLT X-11104

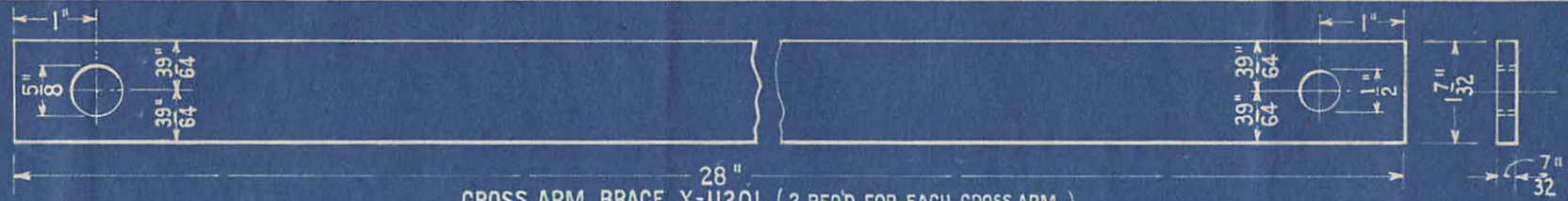
SCALE AND ALL DIMENSIONS SHOWN IN INCHES.

N. Y. C. R. R.
SIGNAL DEPARTMENT
STRAIN INSULATOR
ALBANY, JAN. 11, 1924.

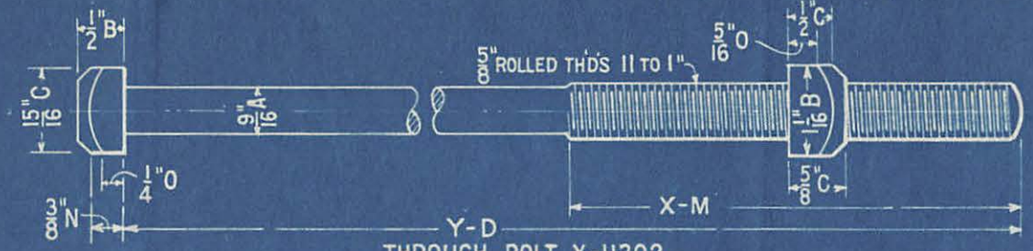
W. H. Elliott 1/11/24
SIGNAL ENGINEER.

X-112
REV.

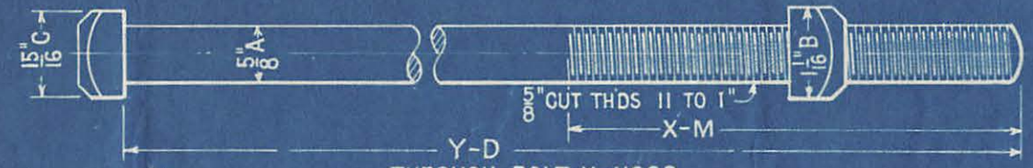
10-9-17



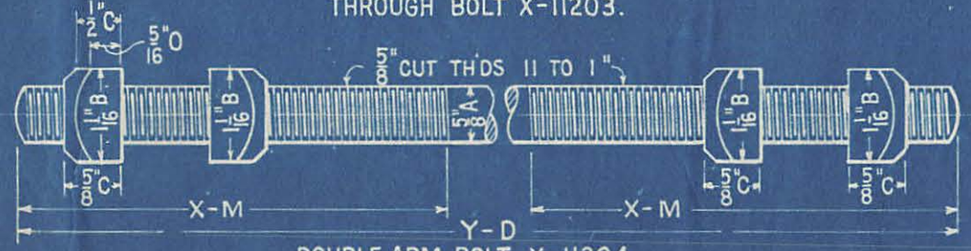
CROSS ARM BRACE X-11201, (2 REQ'D FOR EACH CROSS ARM.)



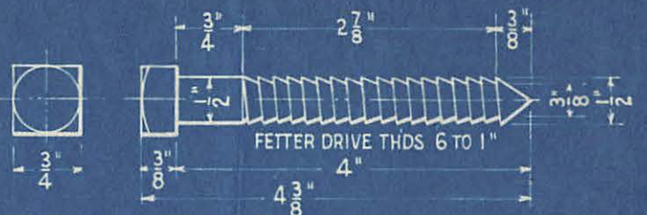
THROUGH BOLT X-11202.



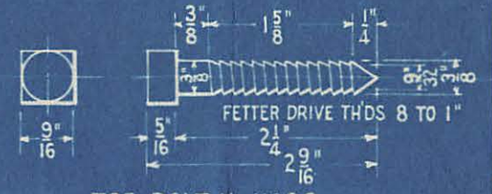
THROUGH BOLT X-11203.



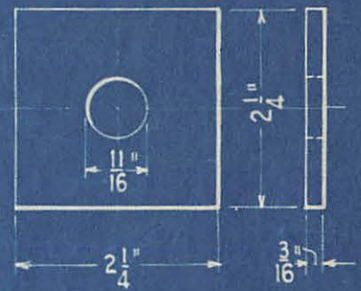
DOUBLE ARM BOLT X-11204.



HEEL BOLT X-11205.
(1 REQ'D FOR EACH PAIR OF BRACES.)



TOE. BOLT X-11206.
(2 REQ'D FOR EACH PAIR OF BRACES.)



WASHER X-11207.
(4 REQ'D FOR X-11204.)
(2 " " X-11202.)
(2 " " X 11203.)

NOTE: ALL MATERIAL TO BE GALVANIZED IRON.
X-11202, X-11203, X-11204, IDENTICAL WITH RSA 1220.
X-11201, X-11205, X-11206, " " RSA 1219.

ALLOWABLE VARIATIONS					
	OVER	UNDER		OVER	UNDER
A	1/64"	1/64"	D	1/8"	1/8"
B	1/32"	1/32"	M	1"	0"
C	1/16"	1/16"	N	1/8"	0"
			O	1/4"	0"

X = THREAD, ON 10" AND 12" BOLTS 4",
ON 13", 14", 16", 18", 20" AND 22" BOLTS, THREAD 6";
ON 14" AND 16" D.A. BOLTS, THREAD 6",
ON 18" TO 22" " " " 8",
Y = LENGTH - 10" TO 22" AS SPECIFIED.

IDENTICAL WITH RSA 1220.

N.Y.C.R.R.

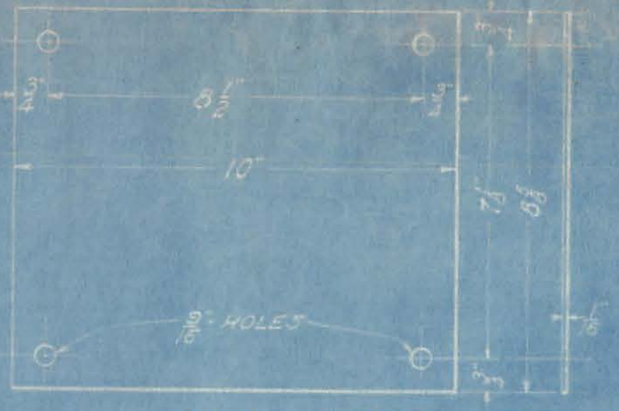
SIGNAL DEPT.

CROSS ARM FITTINGS

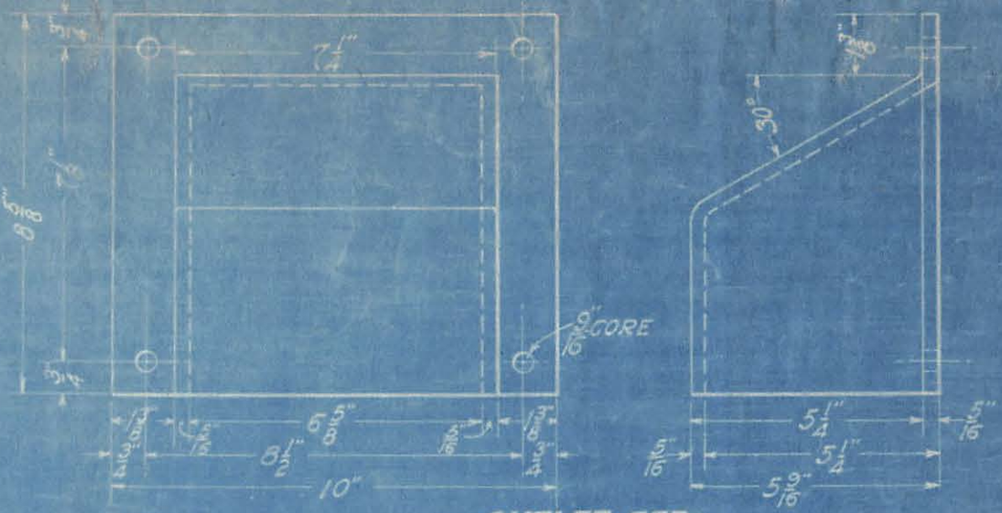
SCALE. HALF SIZE. ALBANY, OCT. 9TH, 1917.

W.A. Elliott 10/10/17
SIGNAL ENGINEER.

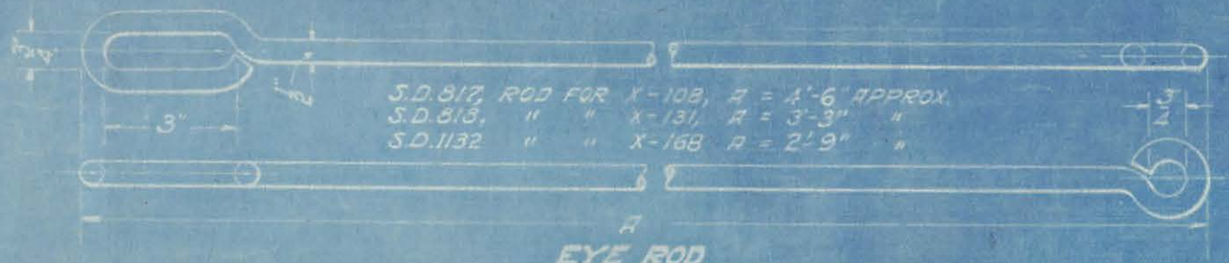
X-113
REV. #6
4-3-17



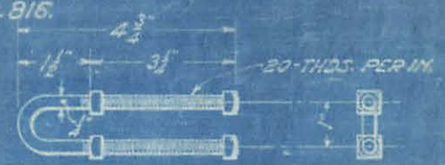
OUTLET COVER
SHEET IRON. AS REQUIRED.
S.D. 815



OUTLET CAP
C.I. AS REQUIRED.
S.D. 816.



EYE ROD
W.I. AS REQUIRED.



STAPLE
W.I. 1-WANTED.
S.D. 819.

HOOK BOLT
W.I. AS REQUIRED.

EYE BOLT
W.I. AS REQUIRED.

WASHER
IRON. AS REQUIRED.

NUT
W.I. AS REQUIRED.

N.Y.C.R.R.

SIGNAL DEPARTMENT

CONCRETE BATTERY BOX DETAILS

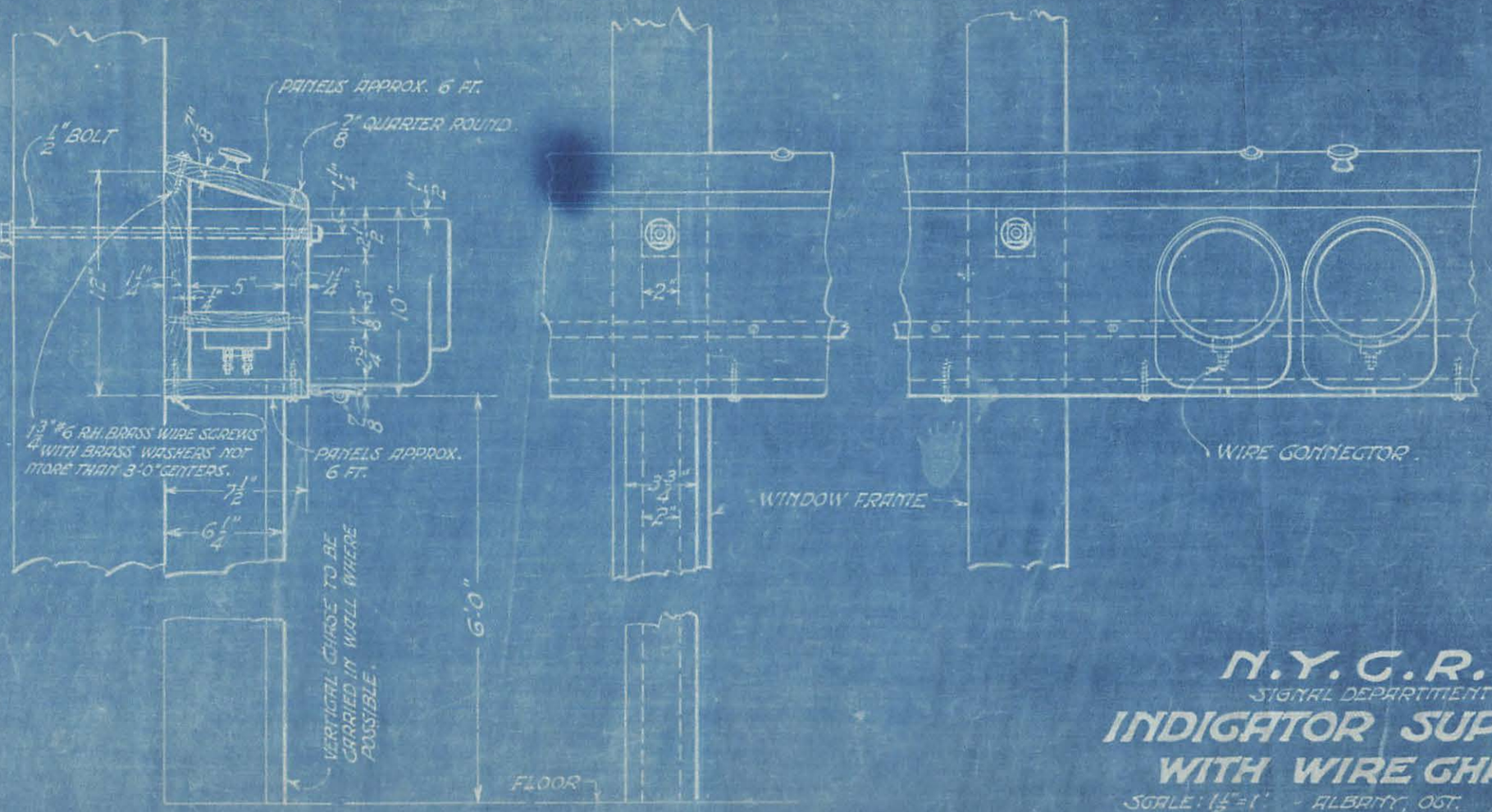
SCALE: 3"=1'-0" ALBANY, NOV. 18, 1912.

W. H. Elsom
SIGNAL ENG'R.

RECD
APR
9
1917

X-114
REV. 3

12-29-15.


PANELS APPROX. 6 FT.
7" QUARTER ROUND.
1½" BOLT
OUTSIDE OF TOWER
1¾" #6 R.H. BRASS WIRE SCREWS WITH BRASS WASHERS NOT MORE THAN 3'-0" CENTERS.
PANELS APPROX. 6 FT.
VERTICAL CHASE TO BE CARRIED IN WALL WHERE POSSIBLE.
6'-0"
FLOOR
WINDOW FRAME
WIRE CONNECTOR.

N.Y.C.R.R.

SIGNAL DEPARTMENT

INDICATOR SUPPORT WITH WIRE CHASE.

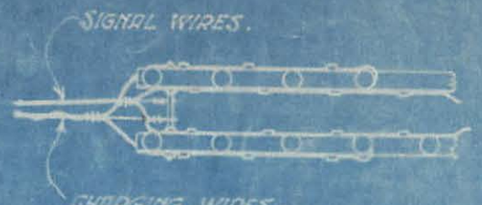
SCALE: 1½"=1' ALBANY, OCT. 7th 1911.

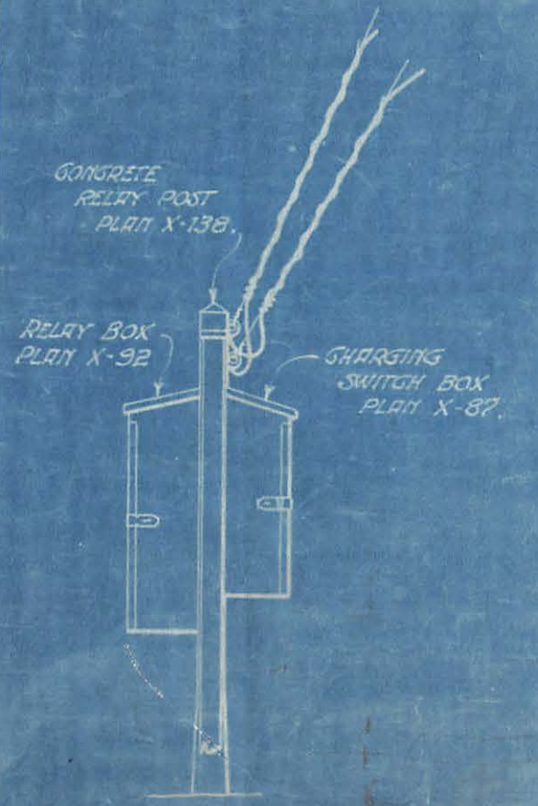
W. H. Elmore 10/7/11.

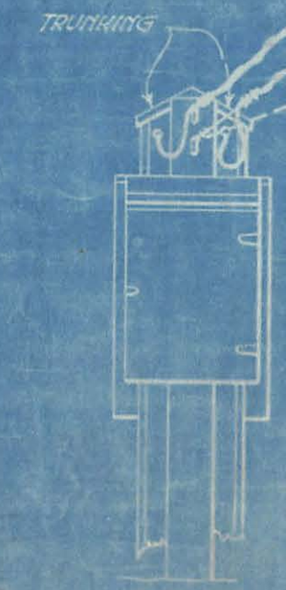
SIGNAL ENGINEER.

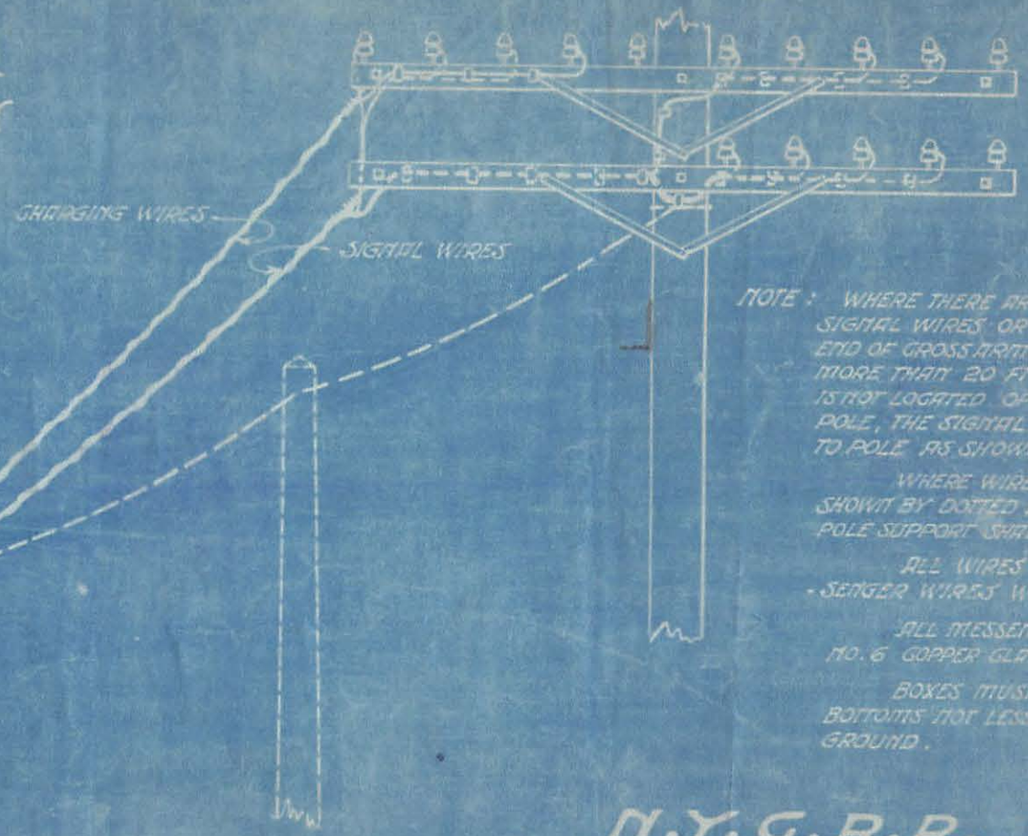
X-116
REV. 3

6-14-16









NOTE: WHERE THERE ARE MORE THAN 15 SIGNAL WIRES OR THE DISTANCE FROM END OF CROSS ARM TO RELAY POST IS MORE THAN 20 FT. OR WHERE RELAY POST IS NOT LOCATED OPPOSITE TELEGRAPH POLE, THE SIGNAL WIRES SHALL GO DIRECT TO POLE AS SHOWN BY DOTTED LINE.

WHERE WIRES ARE INSTALLED AS SHOWN BY DOTTED LINE, INTERMEDIATE POLE SUPPORT SHALL BE PROVIDED.

ALL WIRES FASTENED TO MESSENGER WIRES WITH MARLIN.

ALL MESSENGER WIRES SHALL BE NO. 6 COPPER CLAD STEEL WIRE.

BOXES MUST BE LOCATED WITH BOTTOMS NOT LESS THAN 18 IN. ABOVE GROUND.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

POLE LINE CONNECTIONS TO RELAY & CHARGING SWITCH BOXES.

ALBANY, JUNE 12 1912.

W.H. Elliott. 6/17/12

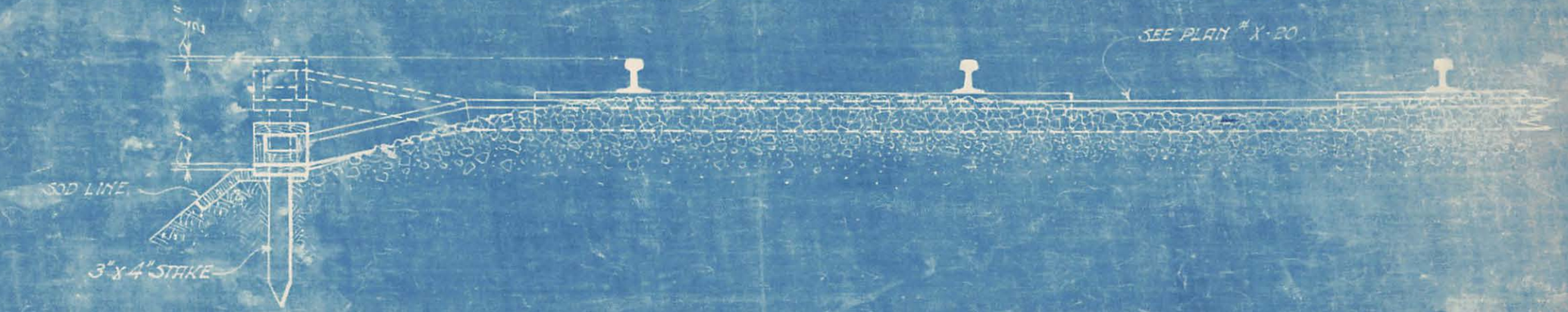
SIGNAL ENGR.

RECD JUN 26 1916 THE U. S. S. & S. CO. SWISSVALE, PA.

SPECIFICATION DEPT. JUN 26 '16 U. S. S. & S. Co.

RECEIVED JUN 27 1916 EST. DEPT.

X-119



NOTE.

WHERE TRUNKING LEAD RUNS PARALLEL WITH AND OUTSIDE OF TRACKS AND CANNOT BE PLACED ONE INCH CLEAR OF GROUND AND HAVE TOP OF TRUNKING LEVEL WITH OR BELOW BOTTOM OF TIE, TRUNKING WILL BE PLACED WITH TOP OF TRUNKING ONE HALF INCH BELOW TOP OF RAIL.

WHERE TRUNKING IS PLACED BETWEEN TRACKS IT WILL BE LAID WITH BOTTOM OF CAPPING EVEN WITH THE TOP OF BALLAST.

STAKES SHOULD BE PLACED IN GROUND, TWO FEET.

FOR TRUNKING SPECIFICATIONS, SEE PLANS Z-45 & Z-46.

N.Y.C.& H.R.R.R.
B. & A.R.R.

SIGNAL DEPARTMENT.

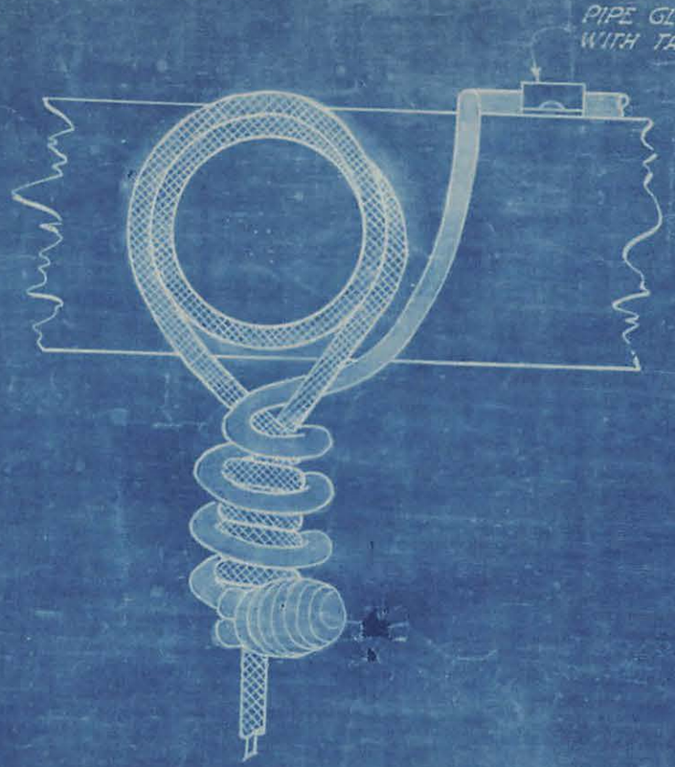
TRUNKING ELEVATION

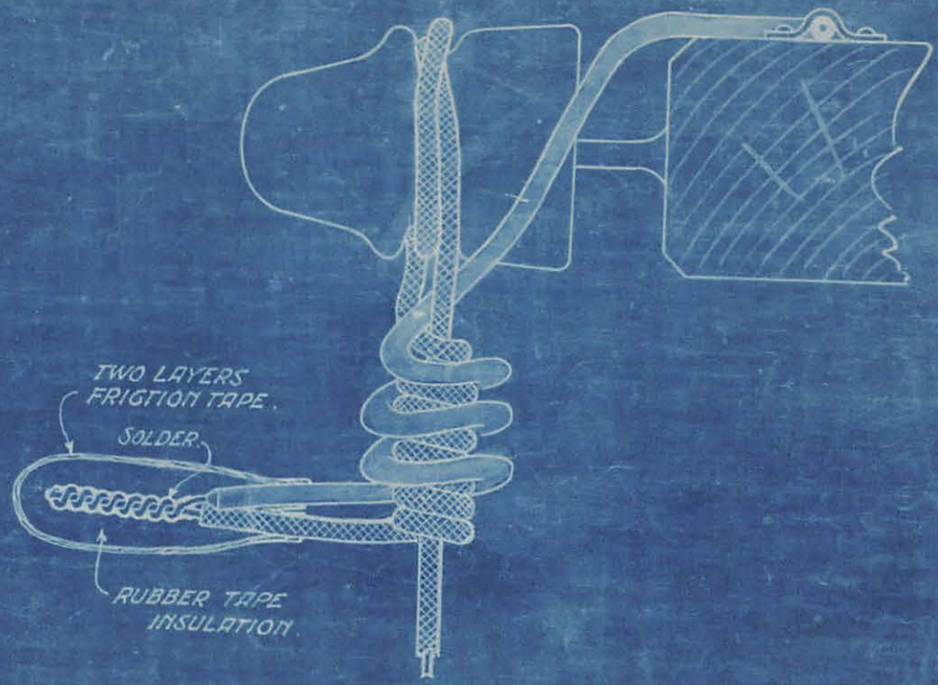
SCALE $\frac{1}{2}$" = 1'.0". ALBANY MAY 3- 1910.

W. H. Elliott. 4/16/10

SIGNAL ENGINEER.

X-123
REV. 4
5-25-15





NOTES:

AFTER CONNECTING TOGETHER THE WIRES, JOINT MUST BE SOLDERED BY DIPPING IN OR POURING ON MELTED SOLDER.

COVERING OF JOINT SHALL BE AS PER SPECIFICATIONS Z-53.

POSITION OF FINISHED JOINT SHALL BE UPRIGHT AS SHOWN.

TINNING, REQUIRED WHERE IRON AND COPPER WIRES ARE TO BE SOLDERED TOGETHER, SHALL BE AS PER SPECIFICATIONS Z-53.

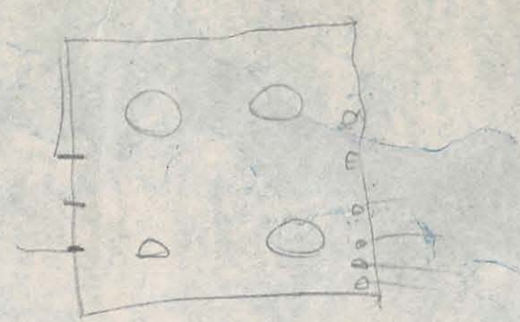
N.Y.C.R.R.

SIGNAL DEPARTMENT.

BRANCH CONNECTION END OF LINE WIRE.

ALBANY, MAY 16TH 1912.

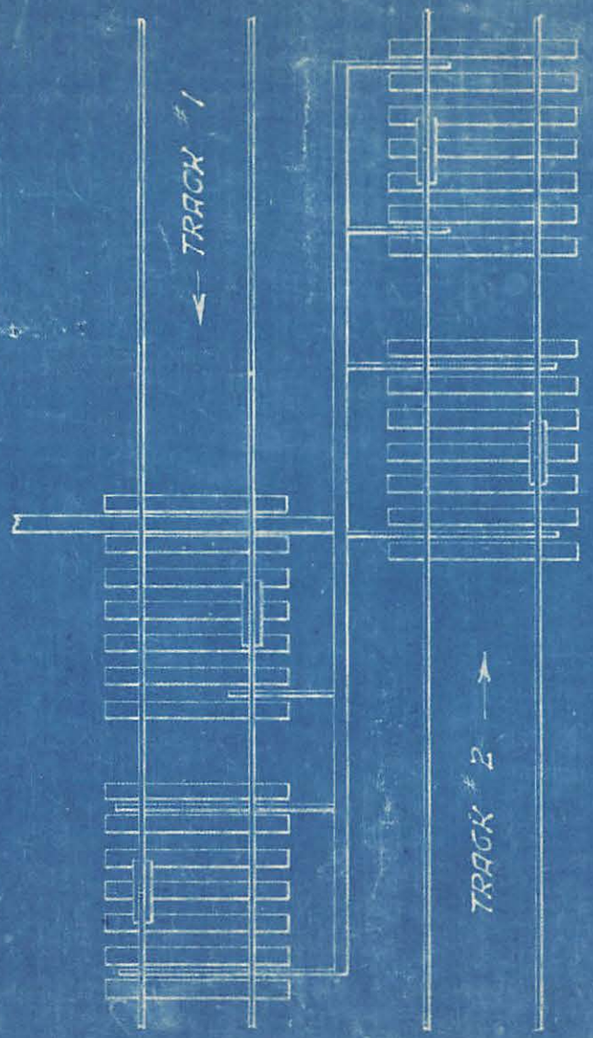
W.H. Elliott 4/10/12.



REC'D
JUN
8
1915

JUN 8 15
U.S.A.S.Co.

X-12-A
REV



NOTE:- FOR TRUNKING SPECIFICATIONS, SEE PLANS I-45 AND I-46

N. Y. C. & H. R. R. R.

SIGNAL DEPARTMENT.

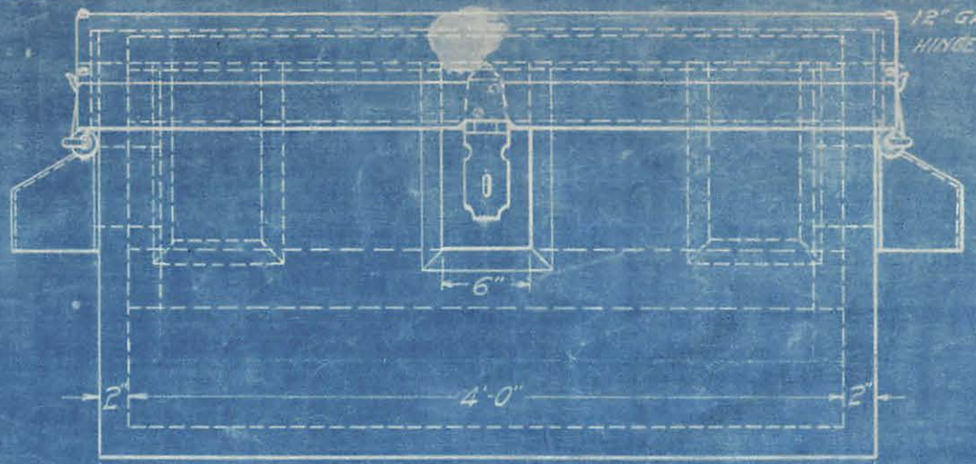
TRUNKING LOCATION,

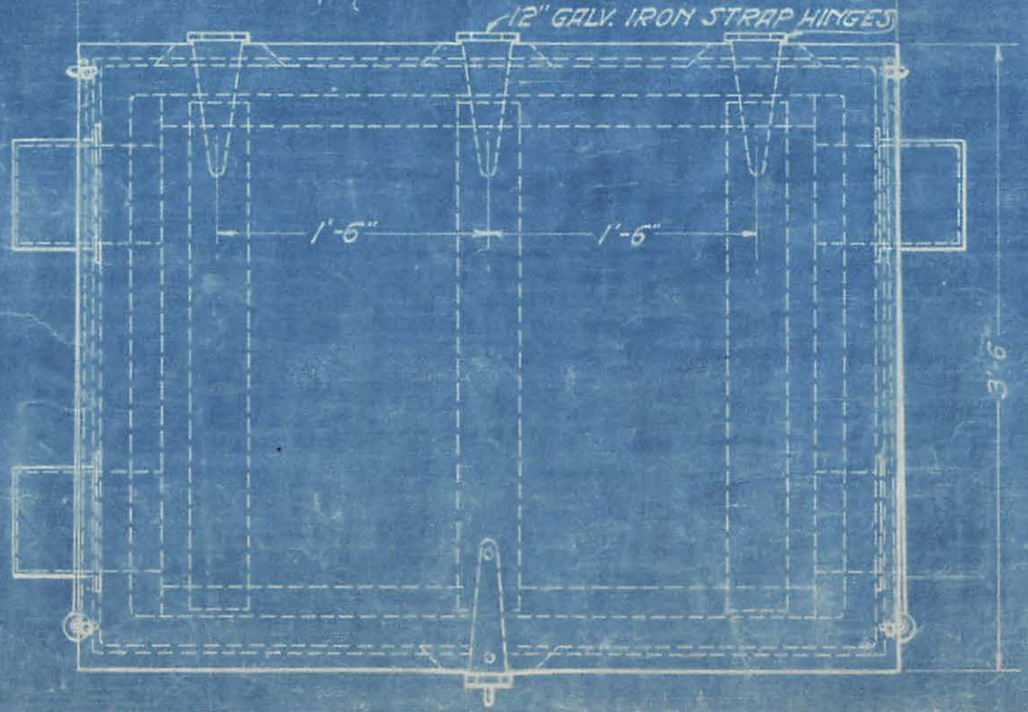
TWO TRACK AUTO. SIGNAL ARRANGEMENT.

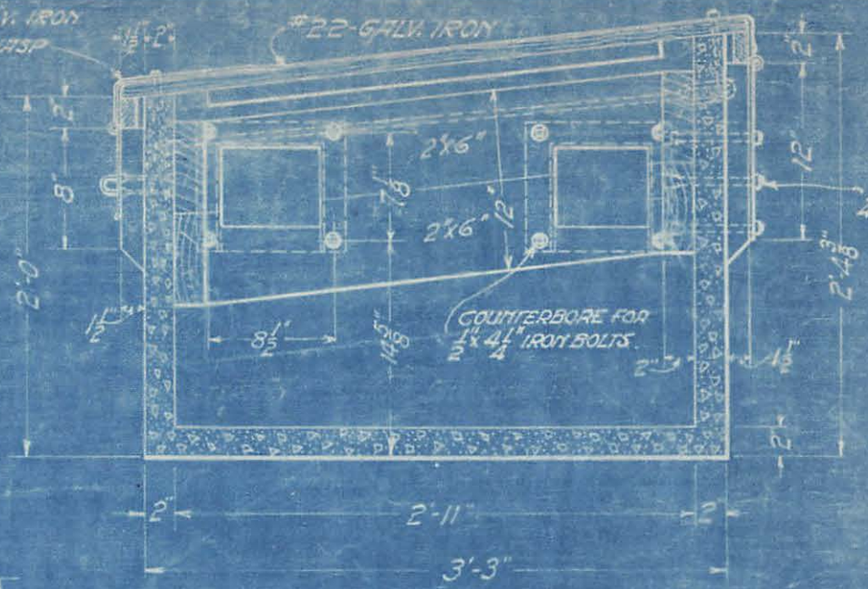
SCALE 1" = 1'. ALBANY, MAY 15-10.

W. H. Elliott. 7/11/10.

SIGNAL ENGINEER.







X-131
REV. 5

4-31

CONCRETE BATTERY BOX WITH TERMINAL BOARD, S.D. 814.
CONCRETE BATTERY BOX WITHOUT TERMINAL BOARD, S.D. 812.
TERMINAL BOARD, S.D. 813.
CONCRETE BATTERY BOX WITH WOOD LINING, S.D. 810, PLAN X-81.

NOTE: FOR DETAILS OF FITTINGS SEE PLAN # X-113.
BOX S.D. 814 SHALL BE EQUIPPED WITH 3 OUTLET CAPS, 1 OUTLET COVER AND 1 PIECE OF COPPER WIRE CLOTH FOR OUTLET.
BOX S.D. 812 SHALL BE EQUIPPED WITH 3" BLOCKS FITTED INTO ALL 4 OPENINGS, 1 OUTLET CAP AND 3 OUTLET COVERS.
LOCATION OF OUTLET CAPS AND COVERS SHALL BE DETERMINED IN THE FIELD.

N.Y.C.R.R.

SIGNAL DEP'T.

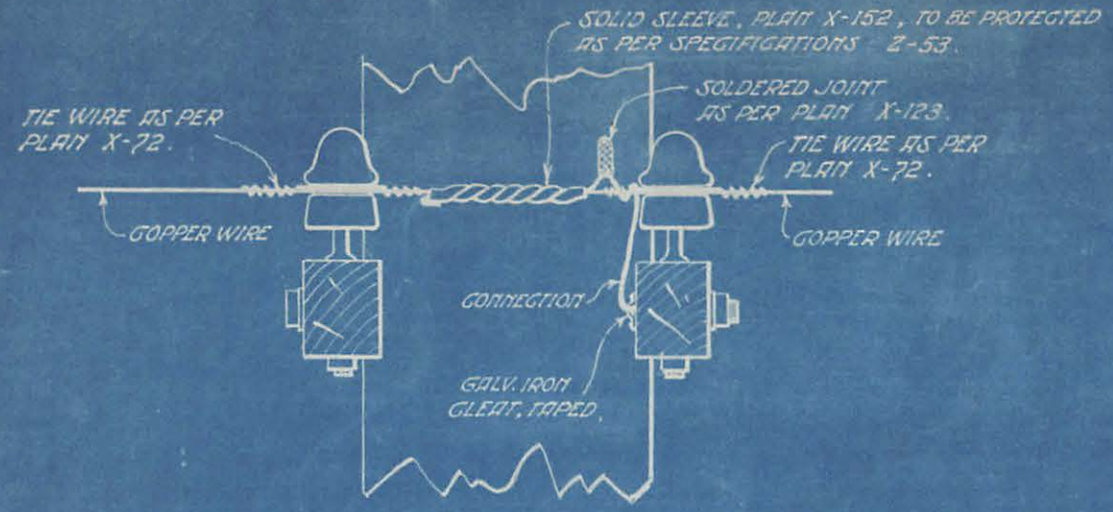
MEDIUM CONCRETE BATTERY BOX

SCALE: 1" = 1'-0". ALBANY, NOV. 21 - 1912.

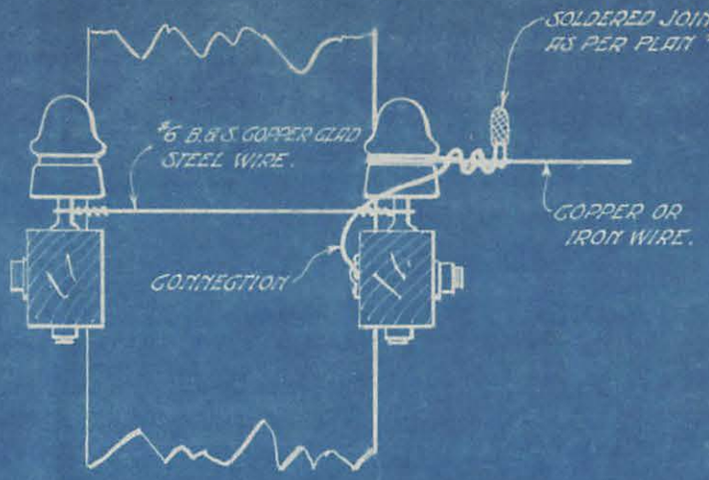
W.H. Elliott. 12/11/12

RECD
APR
1917

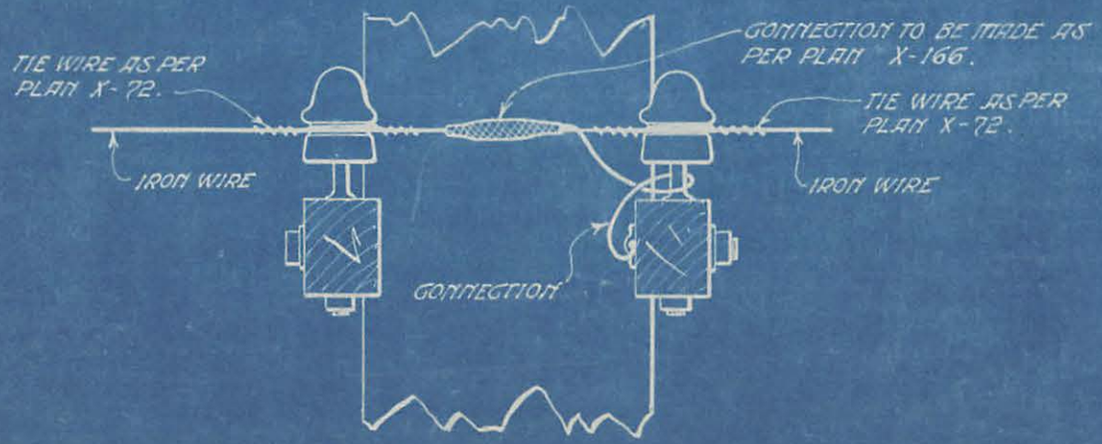
X-132
REV. 5
5-25-15


SOLID SLEEVE, PLAN X-152, TO BE PROTECTED AS PER SPECIFICATIONS Z-53.
SOLDERED JOINT AS PER PLAN X-123.
TIE WIRE AS PER PLAN X-72.
TIE WIRE AS PER PLAN X-72.
COPPER WIRE
COPPER WIRE
CONNECTION
GALV. IRON GLEAT, TAPED.

TAP - COPPER WIRE



DEAD END CONNECTION



TAP - IRON WIRE.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

BRANCH CONNECTIONS.

ALBANY, MAY 25' 1915.

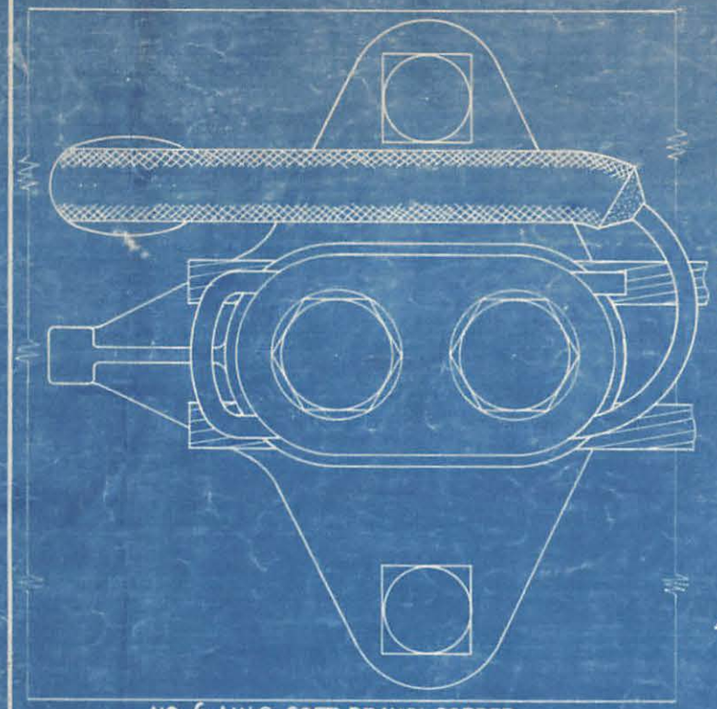
W. H. Elliott 5/25/15

REC'D
JUN
8
1915
THE U. S. S. & B. CO.
CHICAGO, ILL.

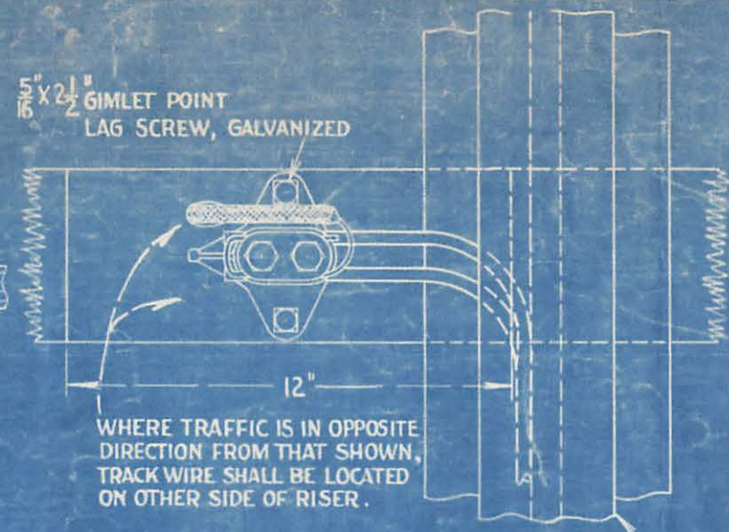
JUN 8 '15
U.S.S.CO.

X-135
REV
12

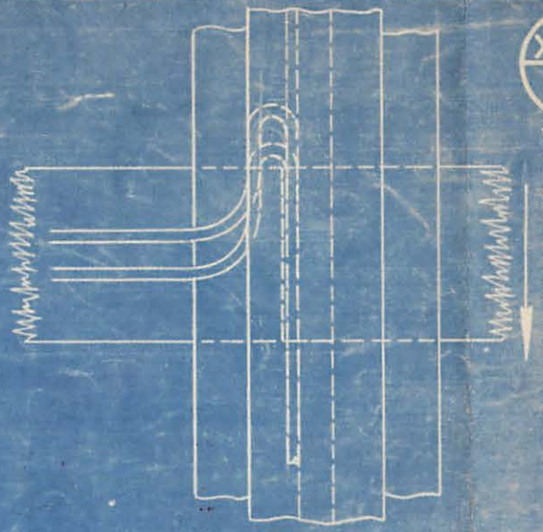
7-3-33



$\frac{5}{16}$" X 2$\frac{1}{2}$" GIMLET POINT
LAG SCREW, GALVANIZED



WHERE TRAFFIC IS IN OPPOSITE DIRECTION FROM THAT SHOWN, TRACK WIRE SHALL BE LOCATED ON OTHER SIDE OF RISER.

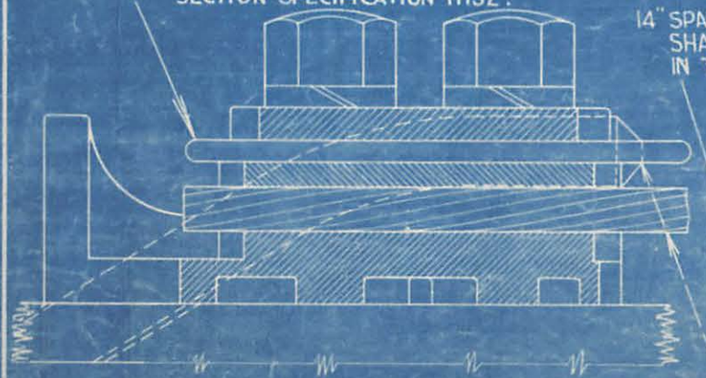


GAUGE OF RAIL

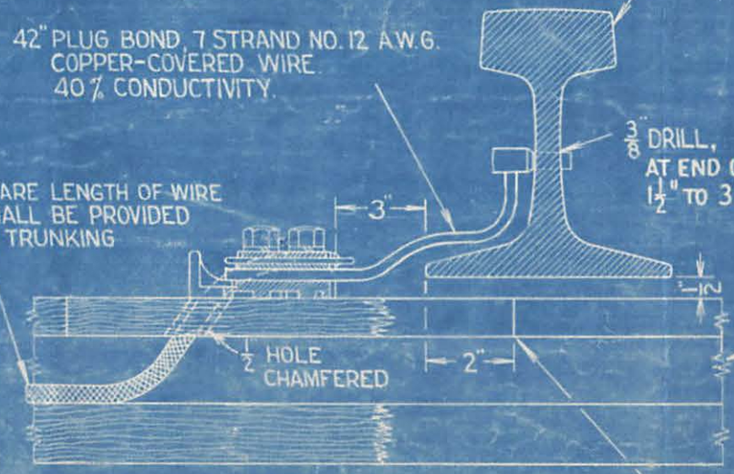
42" PLUG BOND, 7 STRAND NO. 12 A.W.G. COPPER-COVERED WIRE. 40% CONDUCTIVITY.

NO. 6 A.W.G. SOFT DRAWN COPPER RUBBER COVERED, A.R.A. SIGNAL SECTION SPECIFICATION 1132.

14" SPARE LENGTH OF WIRE SHALL BE PROVIDED IN TRUNKING



DETAIL FULL SIZE



$\frac{3}{8}$" DRILL,
AT END OF CIRCUIT, HOLES SHALL BE DRILLED 1$\frac{1}{2}$" TO 3" FROM END OF ANGLE BARS

WHERE TRUNKING DOES NOT EXTEND ACROSS TRACK END SHALL BE MADE AT THIS POINT WITH GROOVE IN TRUNKING BLOCKED.

NOTE: THIS DEVICE SHALL NOT BE USED ON CONCRETE TRUNKING.

N. Y. C. R. R.

SIGNAL DEPT – BUFFALO AND EAST

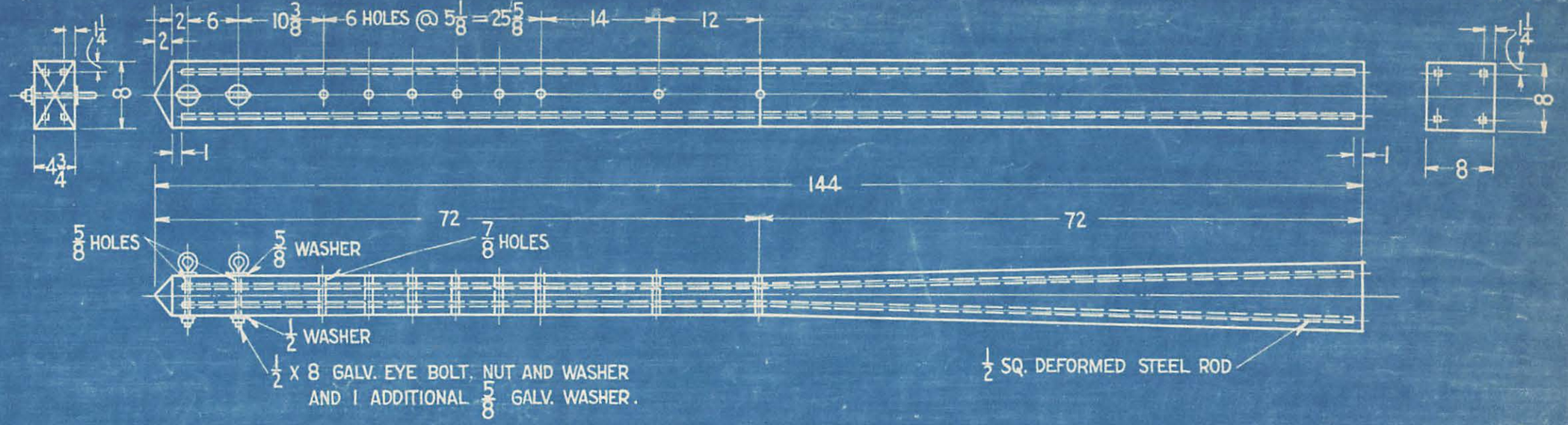
TRACK WIRING

SCALE 3"=1'-0" ALBANY, SEPT. 30, 1930.

W. H. Elliott 10/30
SIGNAL ENGR.

DEPT. 41
JUL 22 1933

X-138
REV.
3
4-70-2



X-13801 RELAY POST COMPL.
X-13802 " " " WITHOUT EYE BOLTS

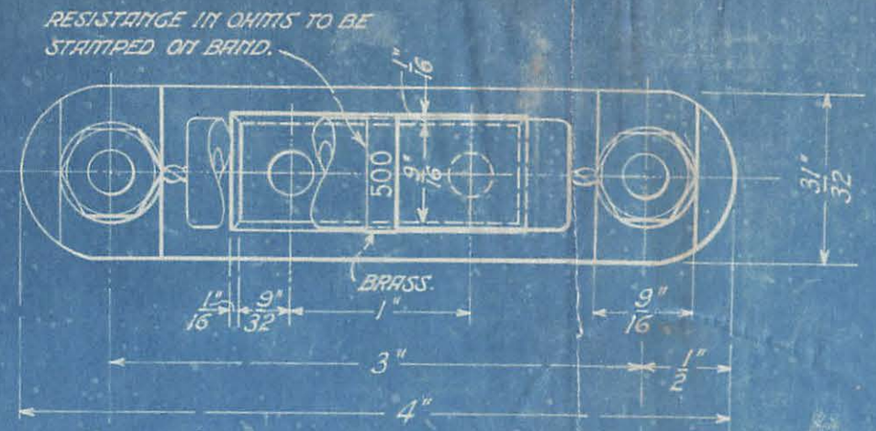
NOTE: POST SHALL BE IN ACCORDANCE WITH SPECIFICATION FOR CONCRETE POSTS, PLAN Z-79.
POST SHALL BE INSTALLED APPROX. 4'-6" IN GROUND.

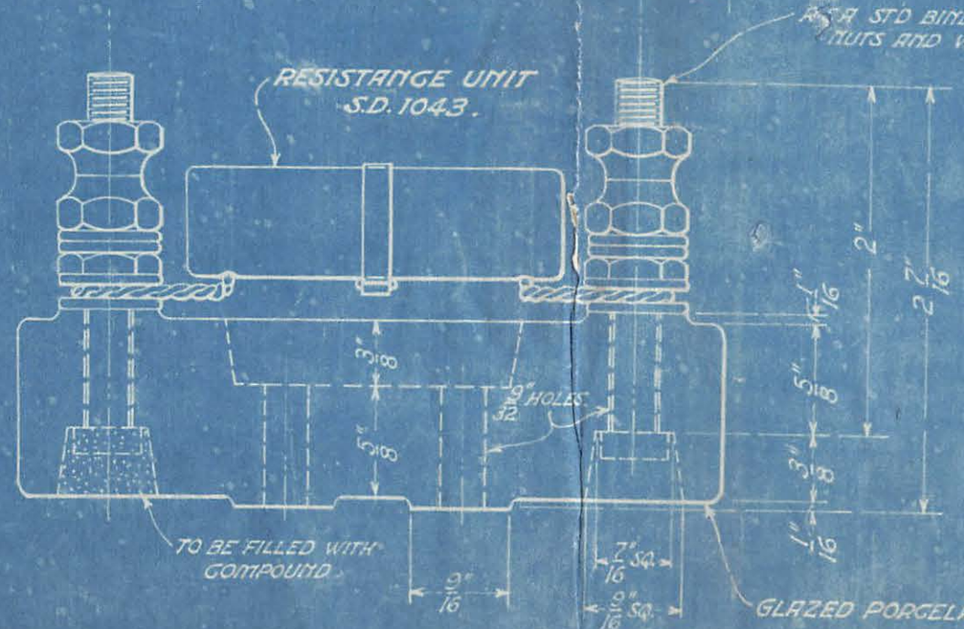
0 3 6 9 12 24 36
SCALE AND ALL DIMENSIONS ARE GIVEN IN INCHES.

N. Y. C. R. R.
SIGNAL DEPARTMENT
CONCRETE RELAY POST
ALBANY, SEPT. 2 - 1911.

W. H. Elliott 4/22/20
SIGNAL ENGINEER

X-13
REV. 3
5-10-1





RESISTANCE UNIT COMP. S.D. 1045.
BASE WITH BINDING POSTS S.D. 1044.

NOTE: TYPE SHOWN IS THAT OF GEN. ELEC. CR 9102-3.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

RESISTANCE UNIT.

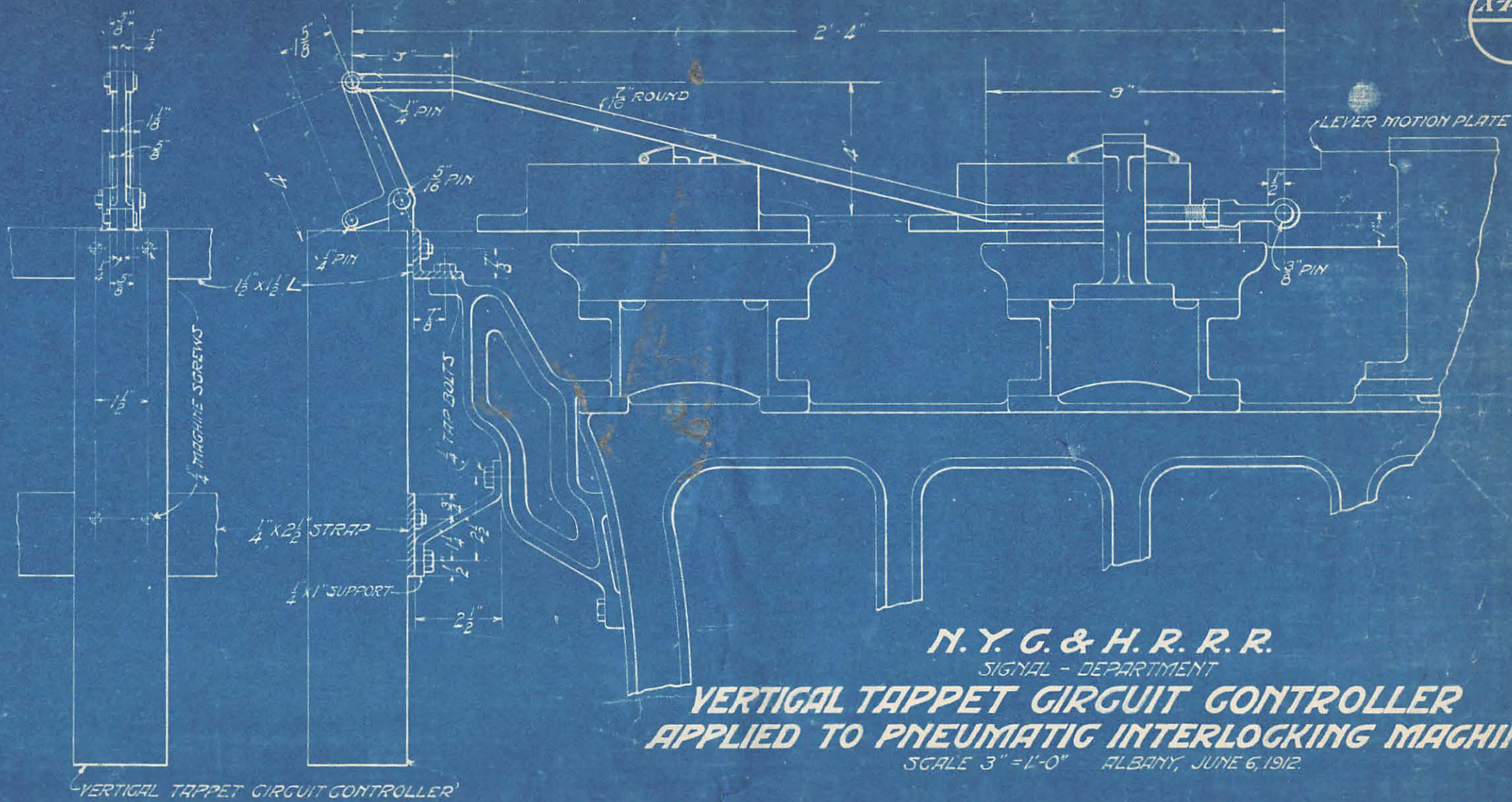
SCALE: FULL SIZE. ALBANY, NOV. 9TH 1915.

W. H. Elliott. 11/13/15

RECD
MAY
18
1916
THE U. S. P.
MUSEUM

SPECIFICATION
DEPT
MAY 18 '16

X-141



N.Y.C. & H.R.R.R.

SIGNAL - DEPARTMENT

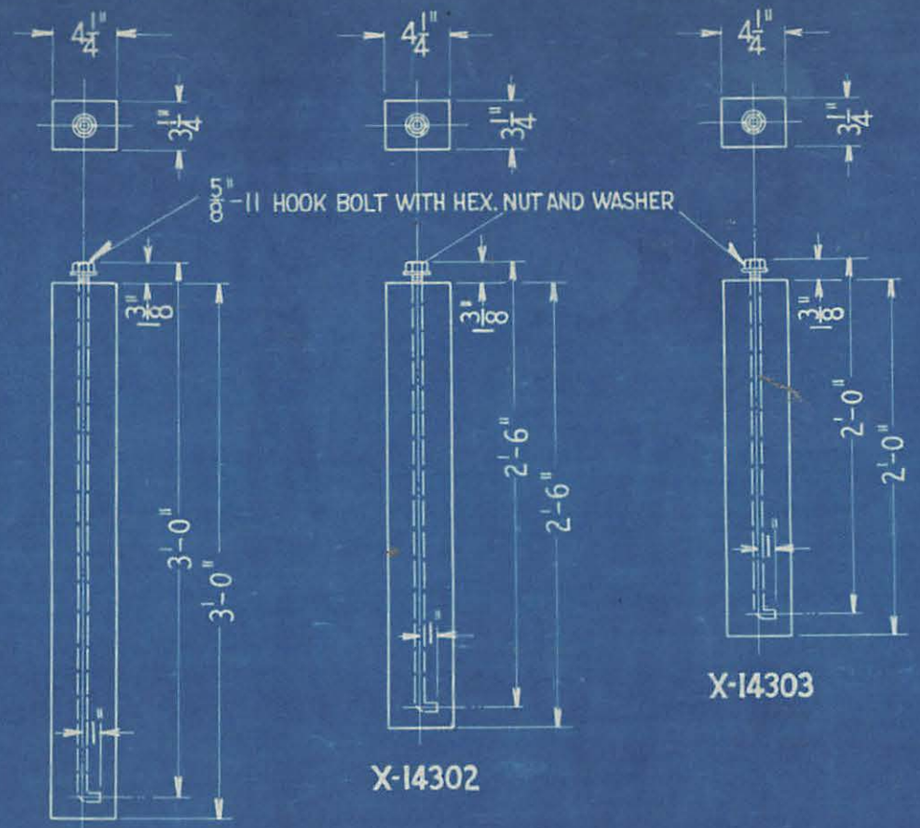
VERTICAL TAPPET CIRCUIT CONTROLLER APPLIED TO PNEUMATIC INTERLOCKING MACHINE

SCALE 3" = 1'-0" ALBANY, JUNE 6, 1912.

W.H. Elliott 6/15/12.

SIGNAL ENG'R.

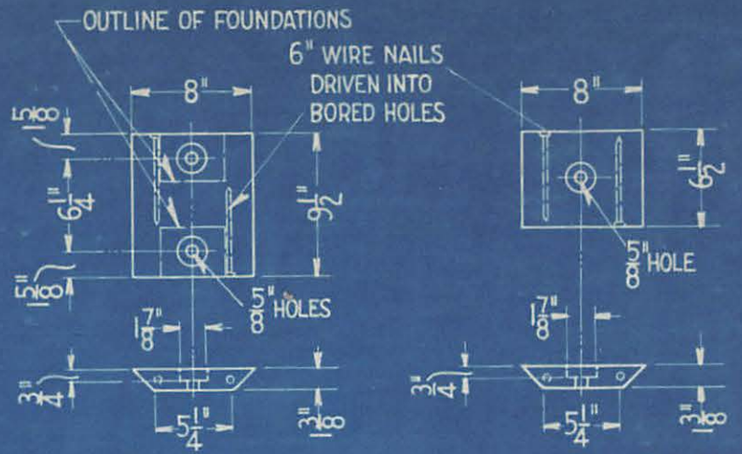
X-143
REV. 2



X-14301

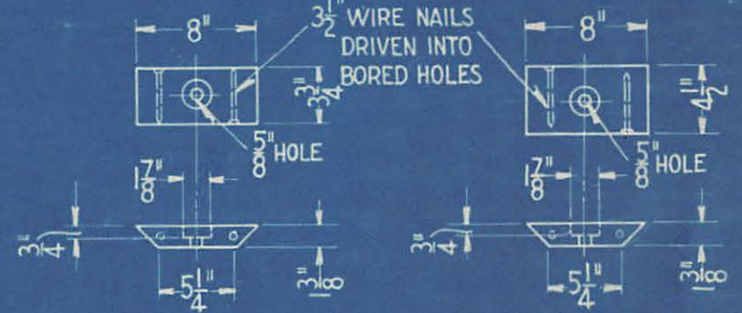
X-14302

X-14303



X-14304, FOR NO. 2 TRUNKING.

X-14305, FOR NO. 3 TRUNKING.



X-14307, FOR NO. 5 TRUNKING.

X-14306, FOR NO. 4 TRUNKING.

FOUNDATION CAPS, CYPRESS.

PROPORTIONS OF CONCRETE

1 PART CEMENT,
3 PARTS BROKEN STONE ¾" SIZE,
2 PARTS SAND OR GRAVEL.

N. Y. C. R. R.
SIGNAL DEPARTMENT

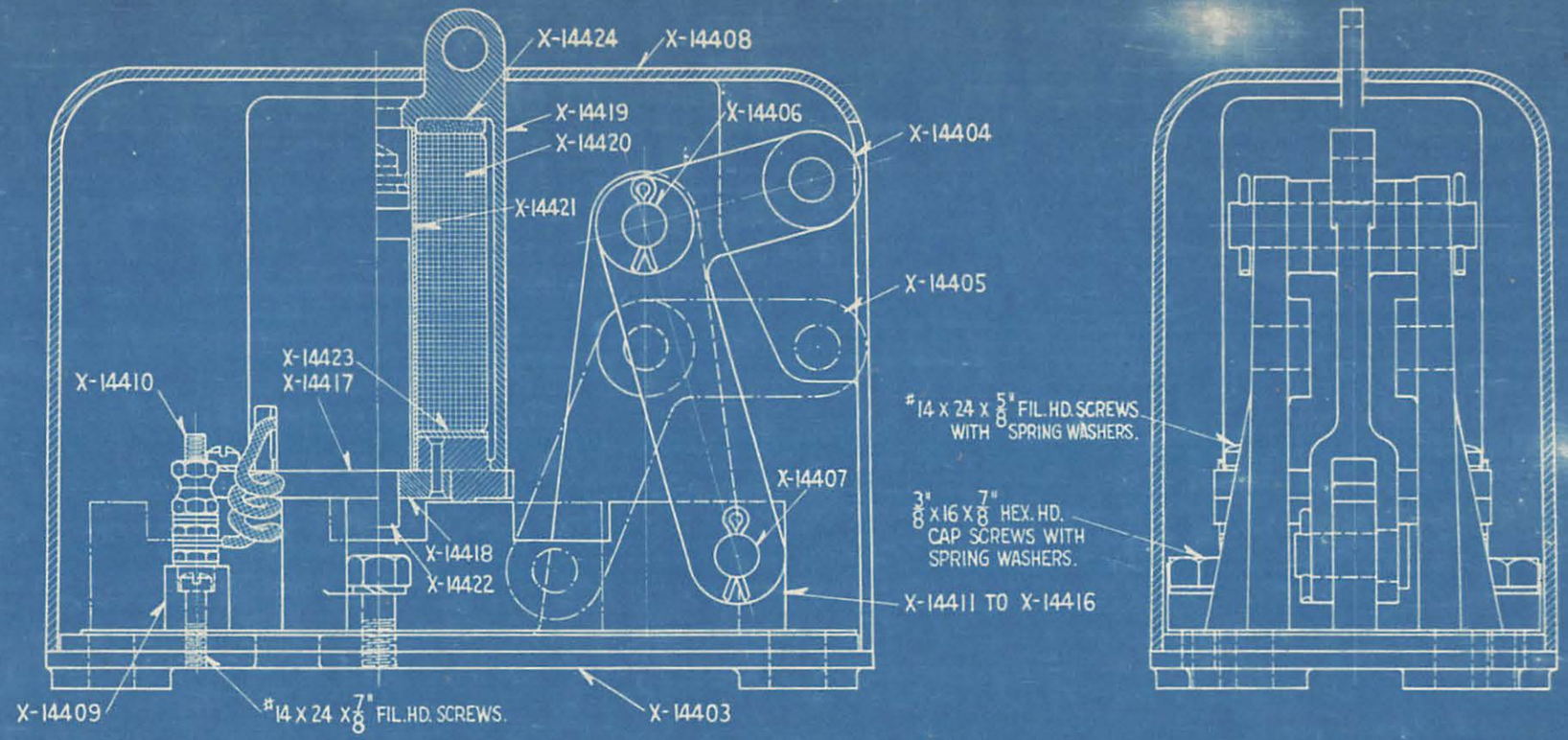
TRUNKING FOUNDATIONS

SCALE: 1"=1'-0." ALBANY, JUNE 23-1913.

W. H. Elliott 6/24/13
SIGNAL ENGINEER

X-144
REV.

4 SHEETS
SHEET 1



X-14401 ASSEMBLY FOR TAPPET CONNECTION WITH CRANK X-14404 AND LOCK SLIDE AS SPECIFIED.

X-14402 ASSEMBLY FOR ROCKER CONNECTION WITH CRANK X-14405 AND LOCK SLIDE AS SPECIFIED.

NOTES:

LOCK SHALL HAVE COIL RESISTANCE OF 25 OHMS, MAXIMUM PICK UP OF 8 VOLTS, MINIMUM RELEASE OF 3.5 VOLTS.
RELEASE SHALL BE AS HIGH AS POSSIBLE AND SHALL NOT BE LESS THAN 50 % OF THE PICK UP.

TOLERANCE FOR ALL FINISHED PARTS, WHERE NOT SPECIFIED, SHALL BE + OR − .008".

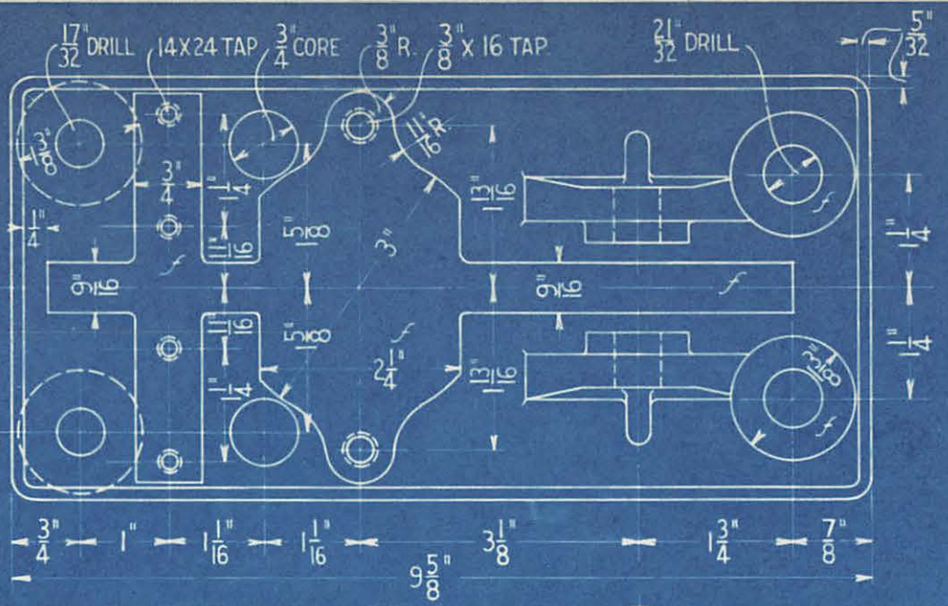
LOCK SHALL BE IN ACCORDANCE WITH A.R.A. SPECIFICATION FOR ELECTRIC LOCK FOR INTERLOCKING MACHINES EXCEPT WHERE INCONSISTENT WITH THIS PLAN.

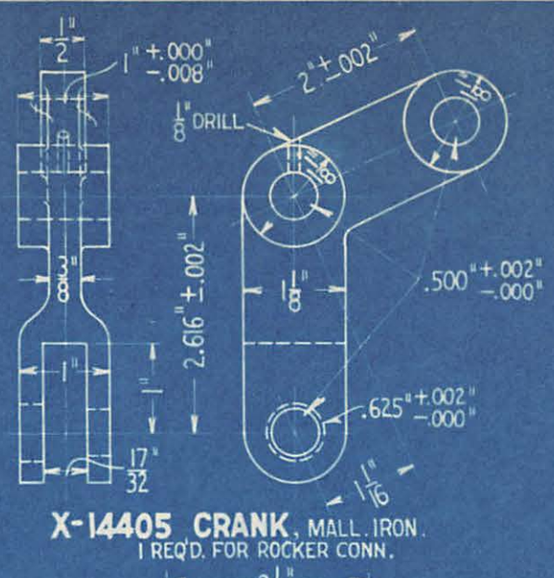
N.Y.C.R.R.
SIGNAL DEPARTMENT

UNIVERSAL LOCK

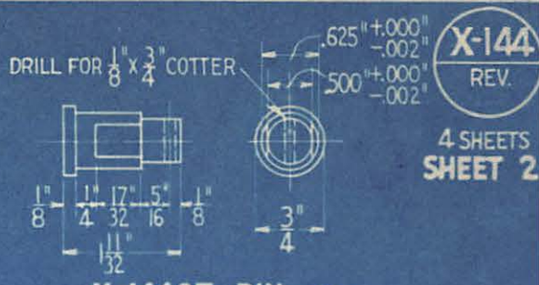
SCALE: HALF SIZE. ALBANY, JAN. 11-1913.

SIGNAL ENGINEER.

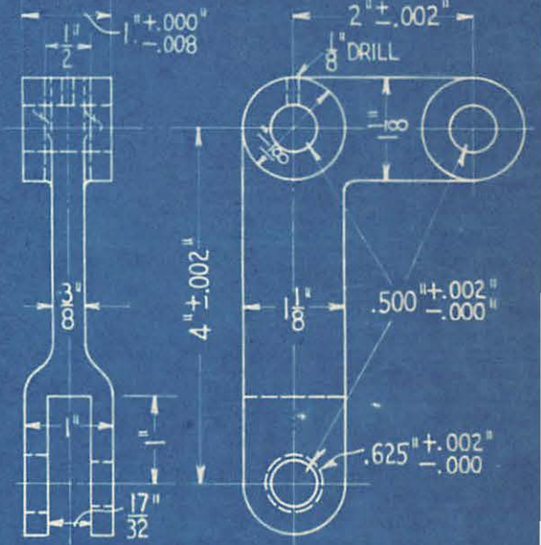




X-14405 CRANK, MALL. IRON.
1 REQ'D. FOR ROCKER CONN.

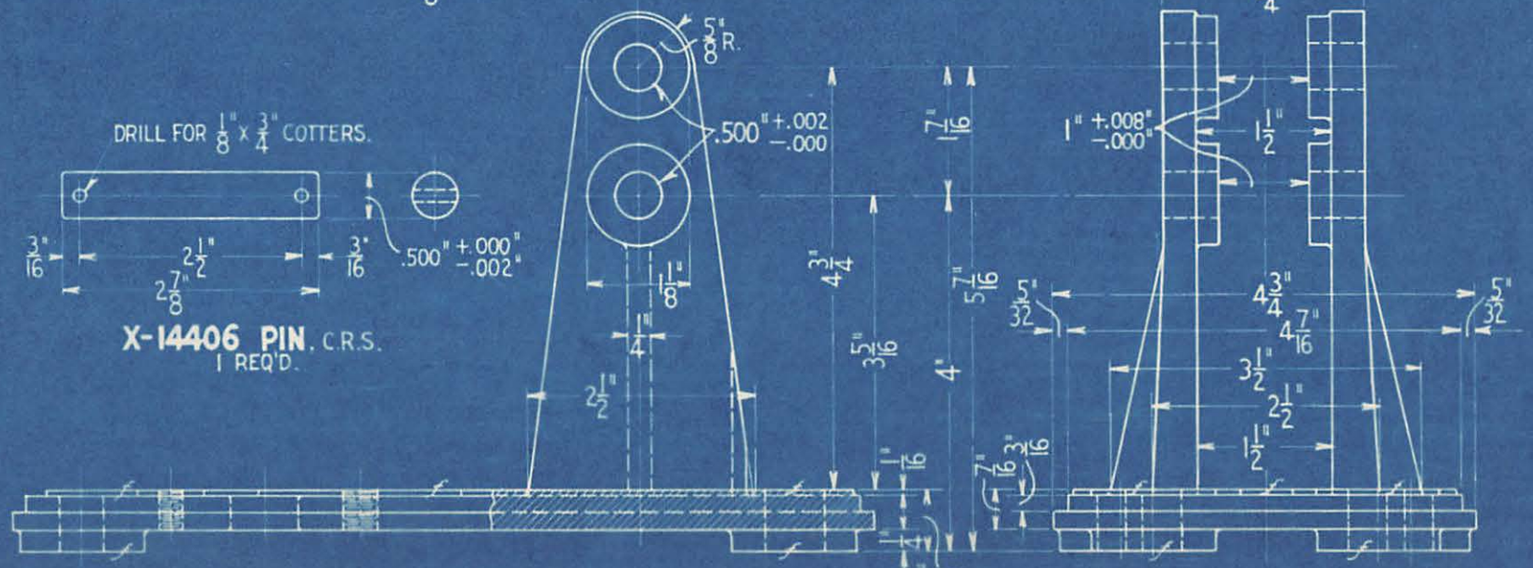


X-14407 PIN, C.R.S.
1 REQ'D.



X-14404 CRANK, MALL. IRON.
1 REQ'D FOR TAPPET CONN.

X-14406 PIN, C.R.S.
1 REQ'D.



X-14403 BASE, GRAY IRON
1 REQ'D.

X-144
REV.

4 SHEETS
SHEET 2

N.Y.C.R.R.
SIGNAL DEPARTMENT

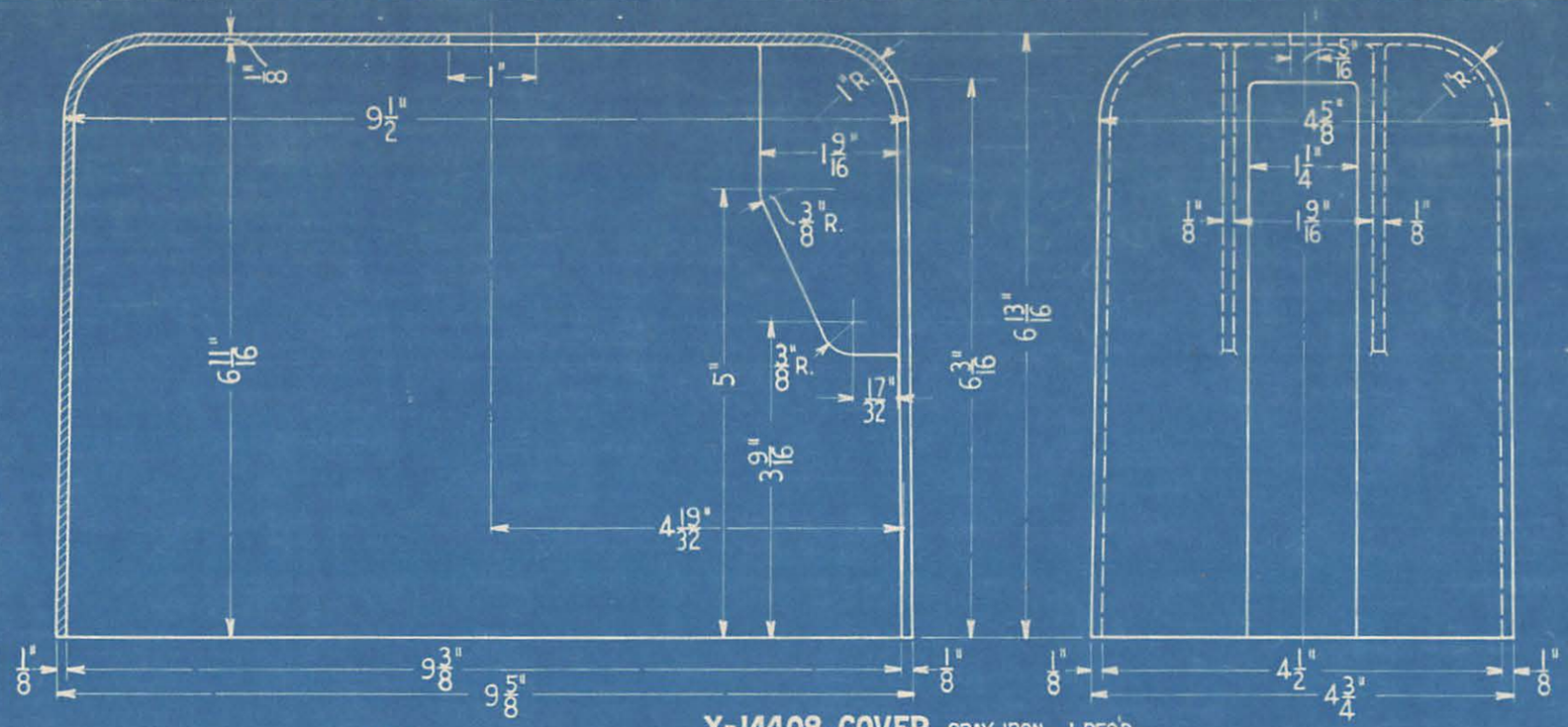
UNIVERSAL LOCK

SCALE: HALF SIZE. ALBANY, JAN. 11-1913.

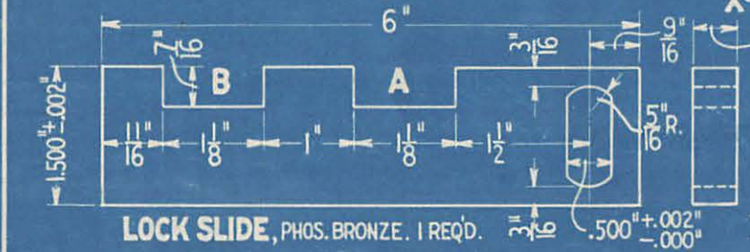
SIGNAL ENGINEER

X-144
REV.

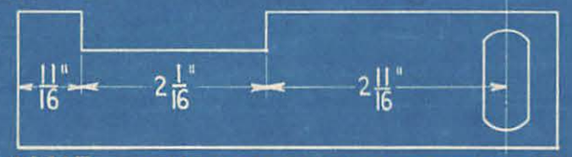
4 SHEETS
SHEET 3



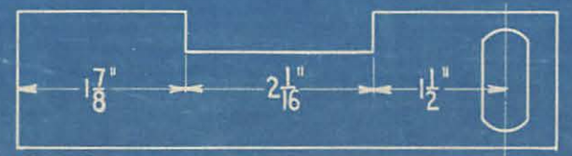
X-14408 COVER, GRAY IRON. 1 REQ'D.



LOCK SLIDE, PHOS. BRONZE. 1 REQ'D.



X-14415 CUT FOR HALF NORMAL LOCK FOR TAPPET CONNECTION, HALF REVERSE LOCK FOR ROCKER CONNECTION.



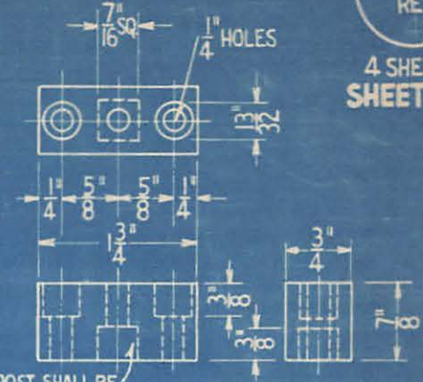
X-14416 CUT FOR HALF REVERSE LOCK FOR TAPPET CONNECTION, HALF NORMAL LOCK FOR ROCKER CONNECTION.

X-14411 CUT FOR NORMAL AND REVERSE LOCK, NOTCHES **A** AND **B** FOR TAPPET OR ROCKER CONNECTION.

X-14412 WITH NOTCH **A** ONLY, REVERSE LOCK FOR TAPPET CONNECTION, NORMAL LOCK FOR ROCKER CONNECTION.

X-14413 WITH NOTCH **B** ONLY, NORMAL LOCK FOR TAPPET CONNECTION, REVERSE LOCK FOR ROCKER CONNECTION.

X-14414 BLANK.



BINDING POST SHALL BE SEALED IN PLACE.

X-14409 TERMINAL BLOCK.
BAKELITE OR EQUIVALENT. 2 REQ'D.

X-14410 BINDING POST, 2 REQ'D.

N. Y. C. R. R.
SIGNAL DEPARTMENT

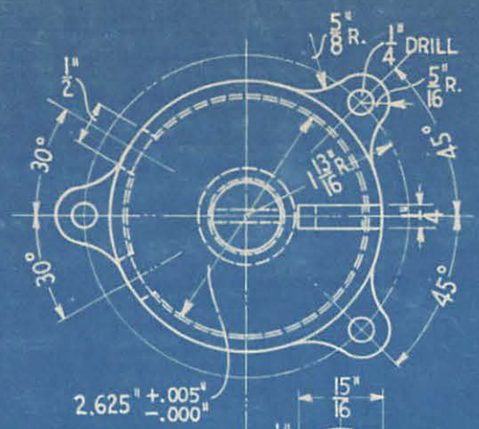
UNIVERSAL LOCK

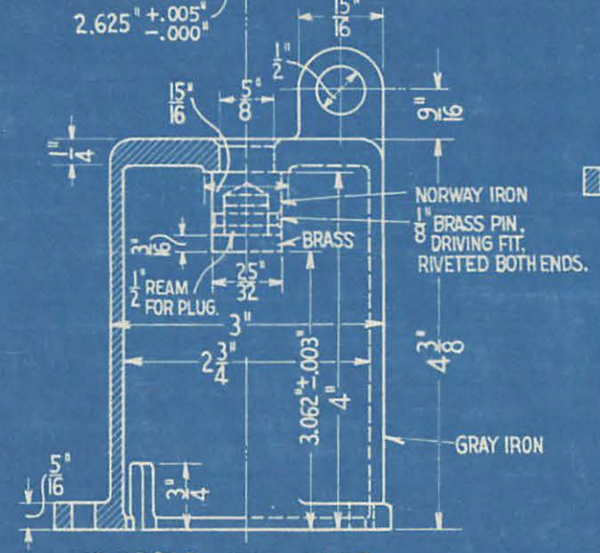
SCALE: HALF SIZE. ALBANY, JAN. 11-1913.

SIGNAL ENGINEER.

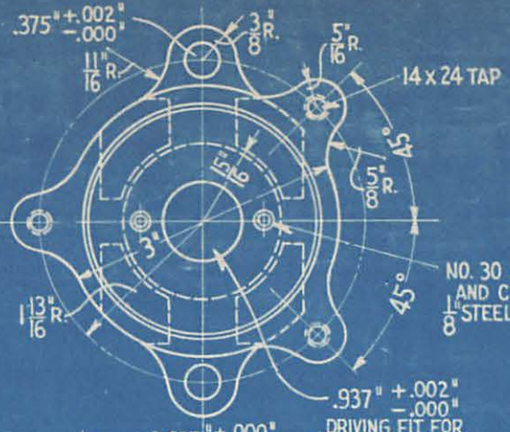
X-144
REV.

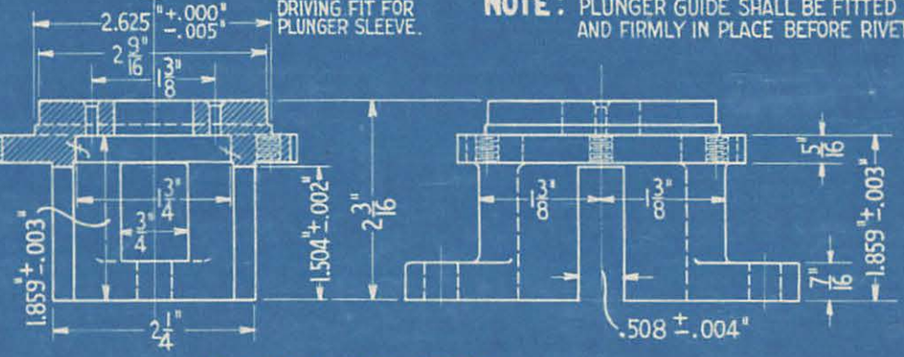
4 SHEETS
SHEET 4



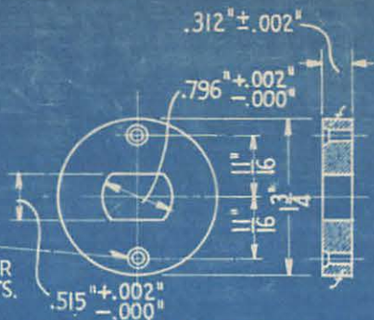


X-14419 COIL CASE, 1 REQ'D.



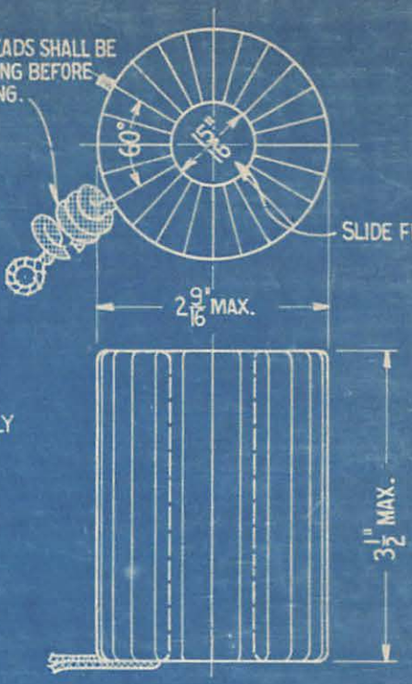


X-14417 COIL BASE, GRAY IRON. 1 REQ'D.



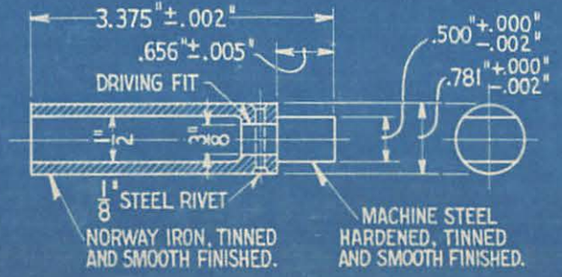
X-14418 PLUNGER GUIDE,
HARD BRASS. 1 REQ'D.

NOTE: PLUNGER GUIDE SHALL BE FITTED TIGHTLY AND FIRMLY IN PLACE BEFORE RIVETING.

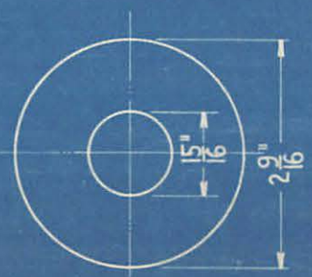


X-14420 COIL
FORM WOUND. 1 REQ'D.

X-14421 PLUNGER SLEEVE,
SEAMLESS BRASS TUBING. 1 REQ'D.



X-14422 PLUNGER
1 REQ'D.



X-14423 FIBRE WASHER, 1/16" THICK.
X-14424 FELT WASHER 1/4" THICK.
1 OF EACH REQ'D.

N.Y.C.R.R.
SIGNAL DEPARTMENT

UNIVERSAL LOCK

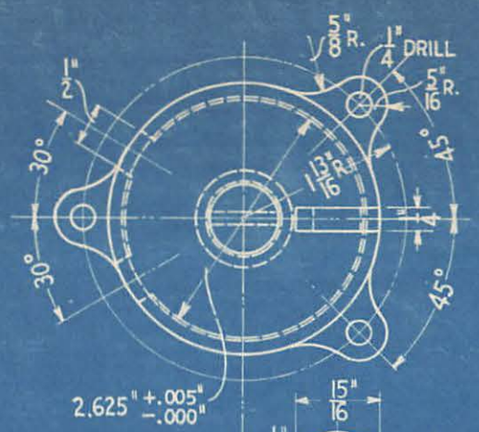
1" SCALE: HALF SIZE. ALBANY, JAN. 11-1913.

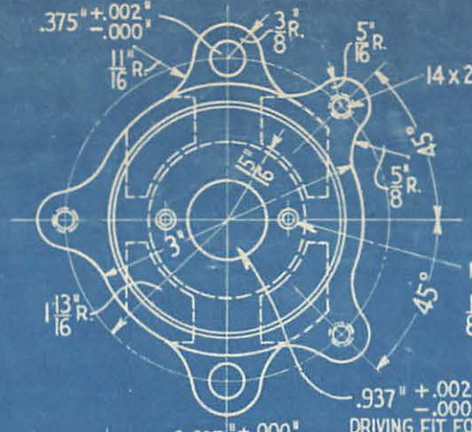
SIGNAL ENGINEER.

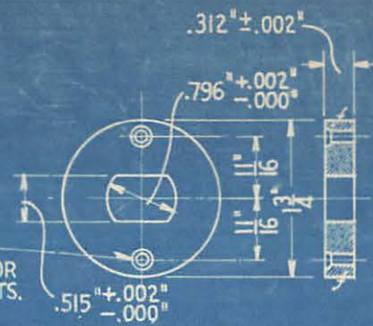
RECEIVED
MAR 15 1916

X-144
REV.

4 SHEETS
SHEET 4

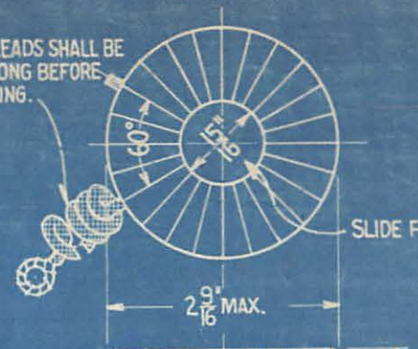


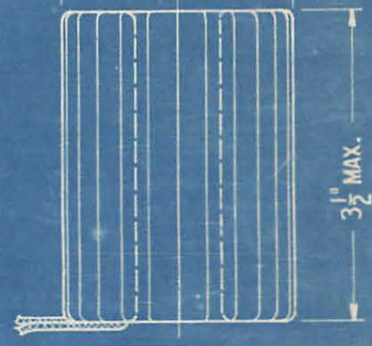




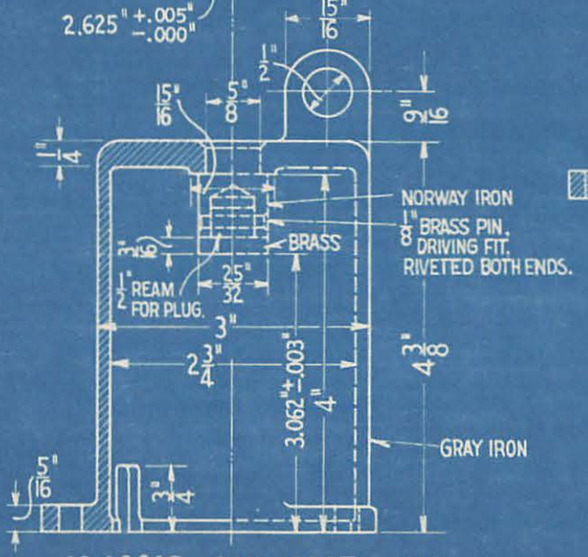
X-14418 PLUNGER GUIDE,
HARD BRASS. 1 REQ'D.

NOTE: PLUNGER GUIDE SHALL BE FITTED TIGHTLY AND FIRMLY IN PLACE BEFORE RIVETING.

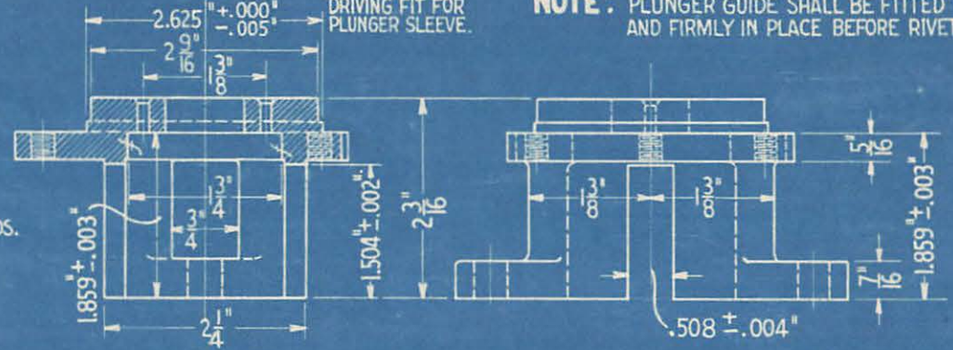




X-14420 COIL
FORM WOUND. 1 REQ'D.

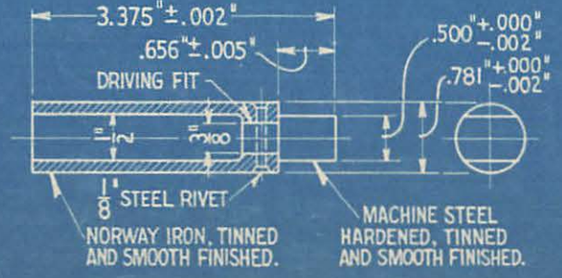


X-14419 COIL CASE, 1 REQ'D.

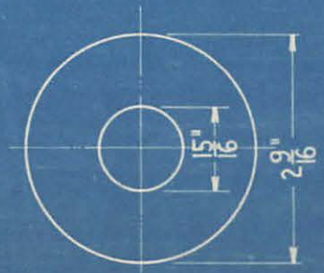


X-14417 COIL BASE, GRAY IRON. 1 REQ'D.

X-14421 PLUNGER SLEEVE,
SEAMLESS BRASS TUBING. 1 REQ'D.



X-14422 PLUNGER
1 REQ'D.



X-14423 FIBRE WASHER, 1/16" THICK.
X-14424 FELT WASHER 1/4" THICK.
1 OF EACH REQ'D.

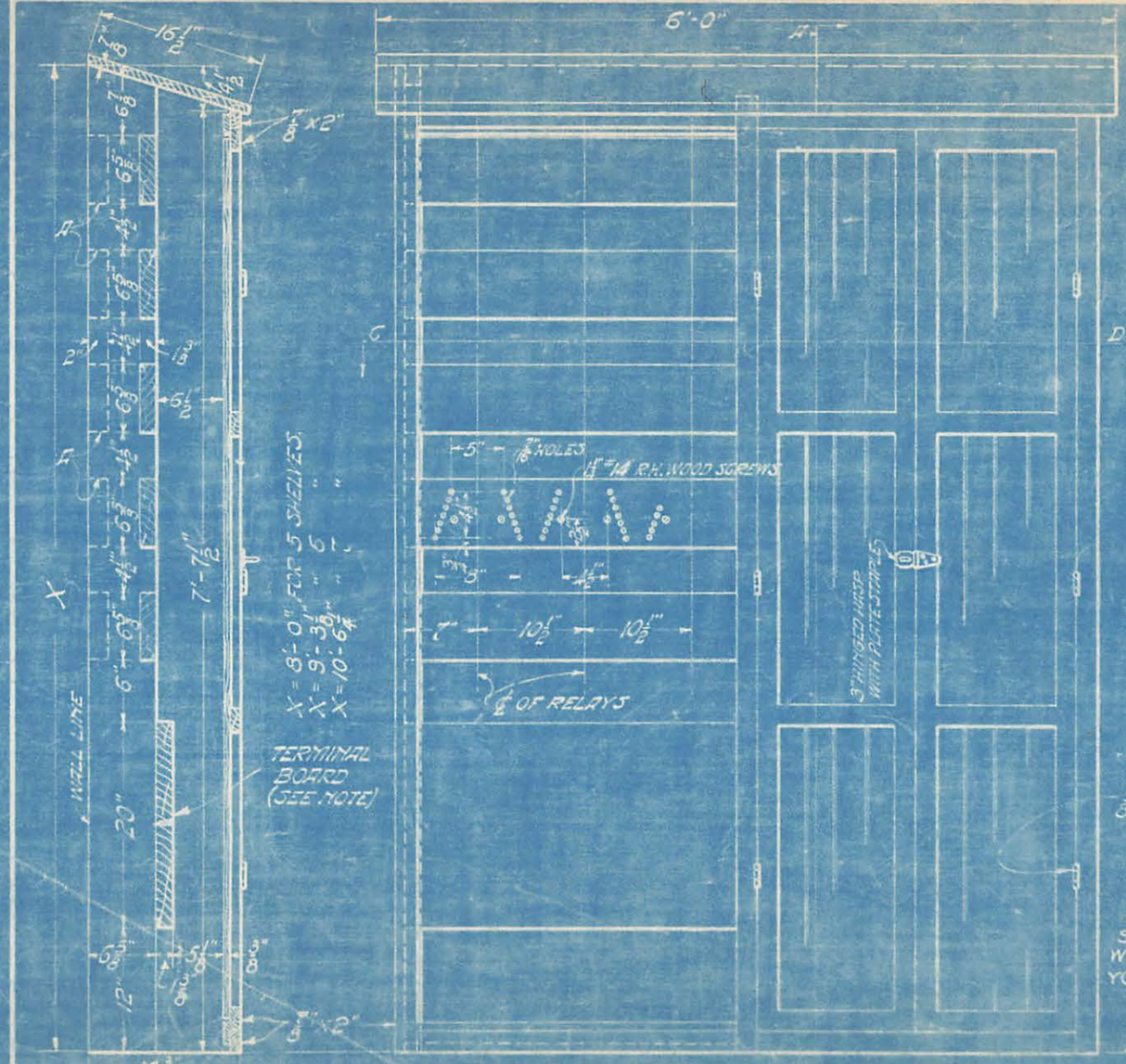
N. Y. C. R. R.
SIGNAL DEPARTMENT

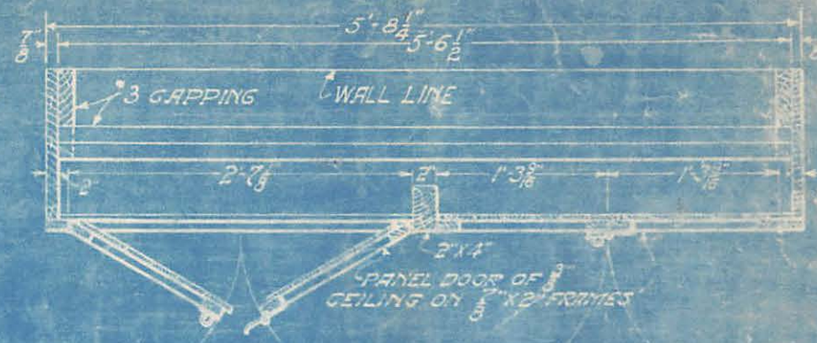
UNIVERSAL LOCK

1" SCALE. HALF SIZE. ALBANY, JAN. 11, 1913.

SIGNAL ENGINEER.

X-146





SECTION C-D.

NOTE:-

LOCATION AND CAPACITY OF RELAY CUPBOARD TO BE DECIDED BY ENGINEER ON GROUND.

DOORS TO BE REMOVABLE WHEN LOCAL CONDITIONS REQUIRE.

TERMINAL BOARD TO BE INCREASED 4" IN WIDTH FOR EACH ADDITIONAL SHELF WHEN MORE THAN 5 SHELVES ARE USED.

INTERMEDIATE SUPPORT FOR RELAY SHELVES TO BE PROVIDED WITH BACK CUT OUT AS SHOWN AT "A", WHEN SHELF SPAN EXCEEDS 5'-6½" IN LENGTH. INCREASED LENGTHS TO BE IN MULTIPLES OF DOUBLE DOORS.

CUPBOARD TO BE MADE OF WHITE PINE, EXCEPT RELAY SHELVES AND TERMINAL BOARD WHICH SHALL BE OF CYPRESS.

7/8" x 3" BUTT HINGES

LO AO CO PO SO WO YO

OM OB OD OQ OT OX OZ

LETTERING OF DISTRIBUTING HOLES

FLOOR LINE

NOTE: FOR SPACING OF WIRE CONNECTORS SEE PLAN X-139

N. Y. C. & H. R. R. R.

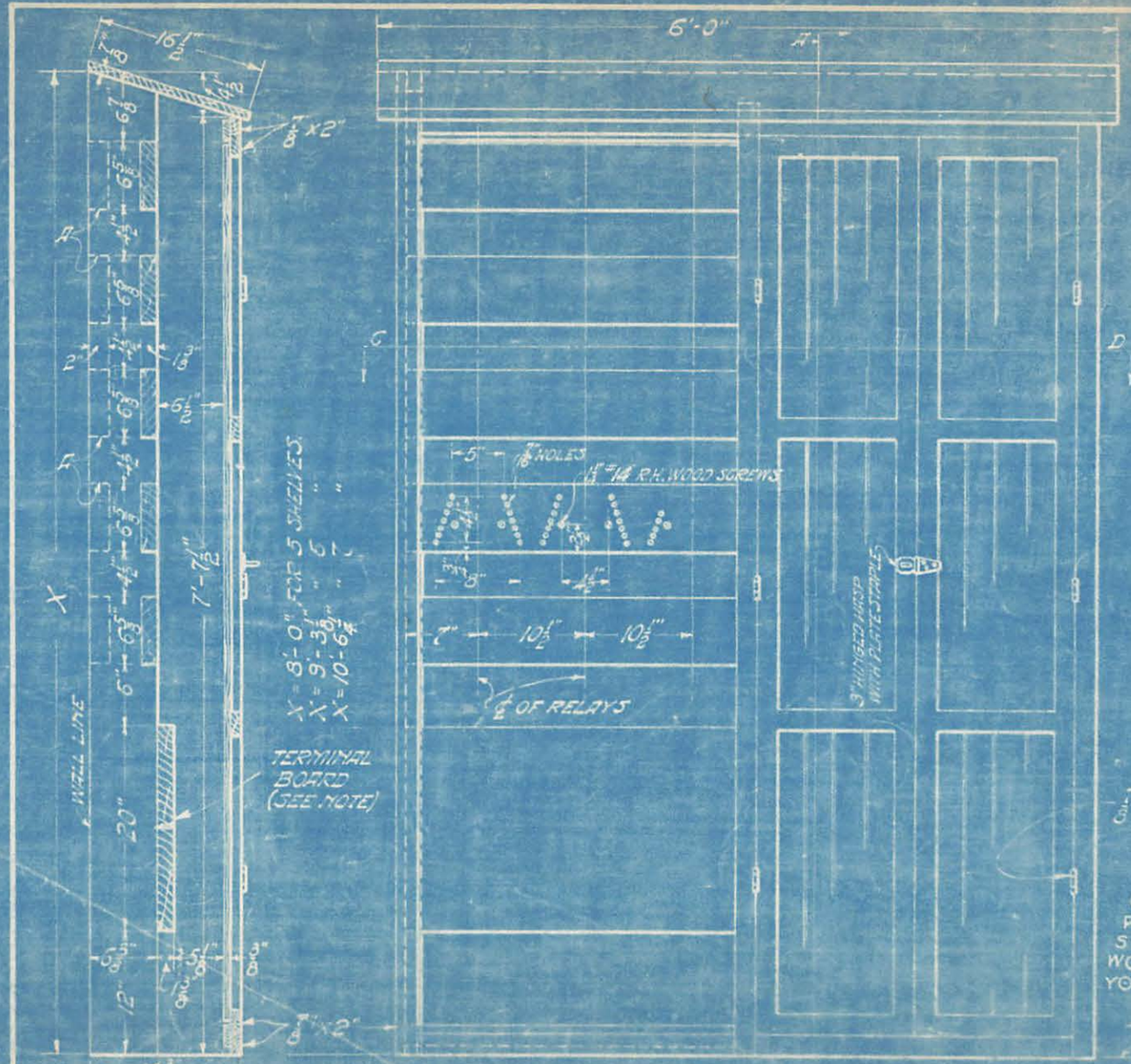
SIGNAL DEP'T.

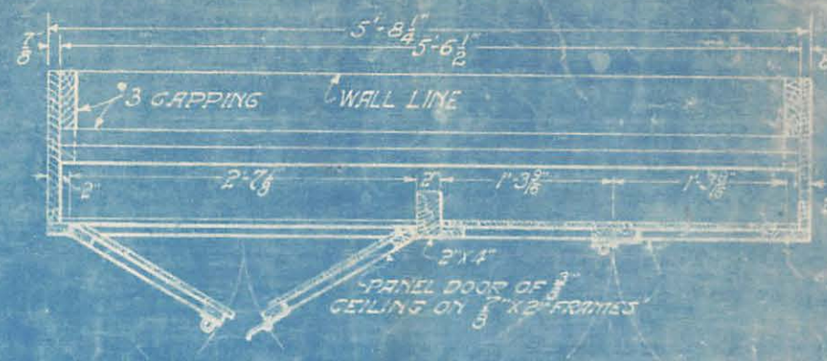
RELAY CUPBOARD

SCALE 3/4" = 1'-0" ALBANY MAR. 17, 1913.

W. H. Elliott
SIGNAL ENGR.

X-146





SECTION C-D.

NOTE:-

LOCATION AND CAPACITY OF RELAY CUPBOARD TO BE DECIDED BY ENGINEER ON GROUND.

DOORS TO BE REMOVABLE WHEN LOCAL CONDITIONS REQUIRE.

TERMINAL BOARD TO BE INCREASED 4" IN WIDTH FOR EACH ADDITIONAL SHELF WHEN MORE THAN 5 SHELVES ARE USED.

INTERMEDIATE SUPPORT FOR RELAY SHELVES TO BE PROVIDED WITH BACK CUT OUT AS SHOWN AT "A", WHEN SHELF SPAN EXCEEDS 5'-6 1/2" IN LENGTH.

INCREASED LENGTHS TO BE IN MULTIPLES OF DOUBLE DOORS.

CUPBOARD TO BE MADE OF WHITE PINE, EXCEPT RELAY SHELVES AND TERMINAL BOARD WHICH SHALL BE OF CYPRESS.

3" X 3" BUTT HINGES

LO
AO
CO
PO
SO
WO
YO

OM
OB
OD
OQ
OT
OX
OZ

LETTERING OF DISTRIBUTING HOLES

FLOOR LINE

NOTE: FOR SPACING OF WIRE CONNECTORS SEE PLAN X-159

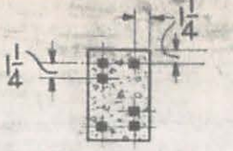
N. Y. C. & H. R. R. R.

SIGNAL DEP'T.

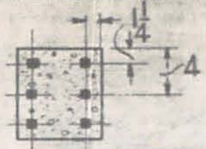
RELAY CUPBOARD

SCALE 3" = 1'-0" ALBANY MAR. 17, 1913.

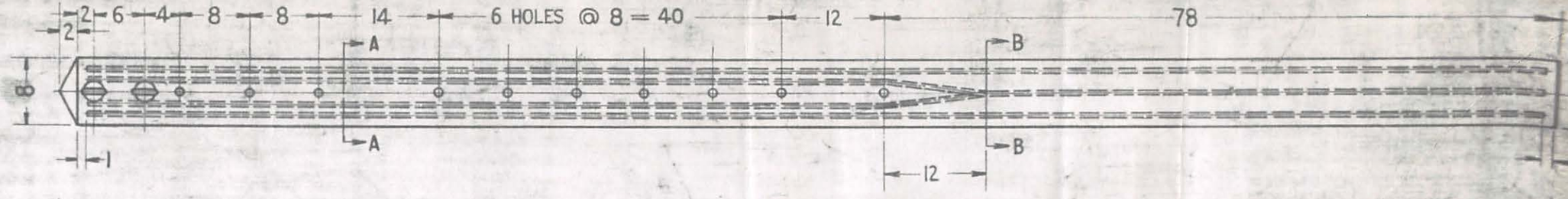
W. H. Elliott
SIGNAL ENGR.

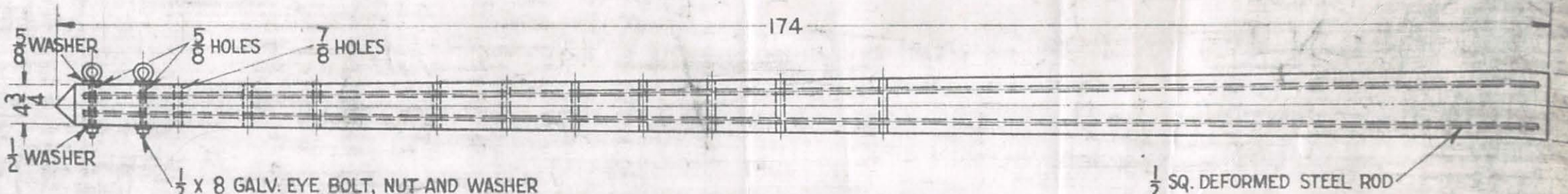


SECTION AA



SECTION BB





X-14801 CROSSING BELL POST COMPL.
X-14802 " " " WITHOUT EYE BOLTS.

NOTE: POST SHALL BE IN ACCORDANCE WITH SPECIFICATION FOR CONCRETE POSTS, PLAN Z-79.
POST SHALL BE INSTALLED APPROX. 4'-6" IN GROUND.

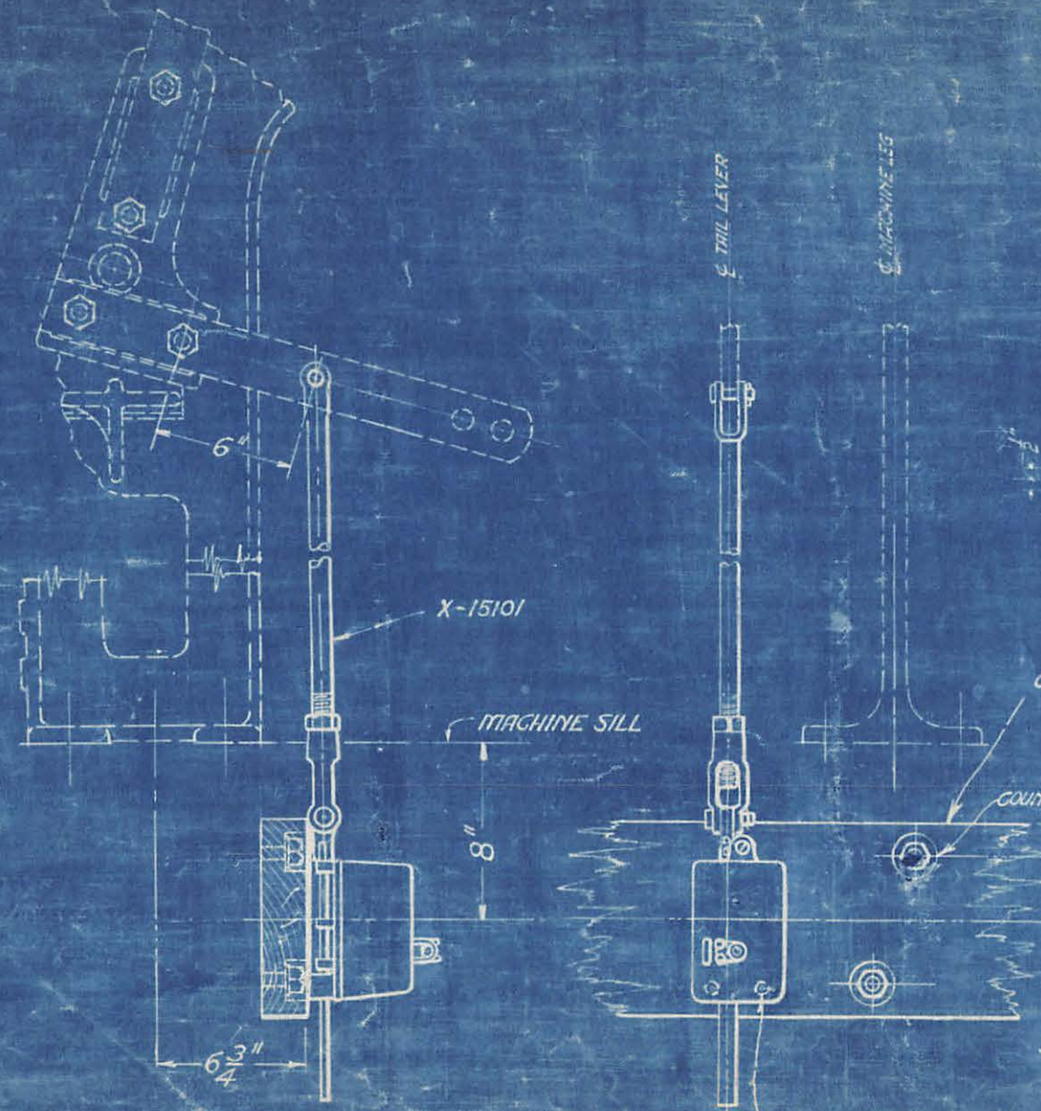
SCALE AND ALL DIMENSIONS ARE GIVEN IN INCHES.

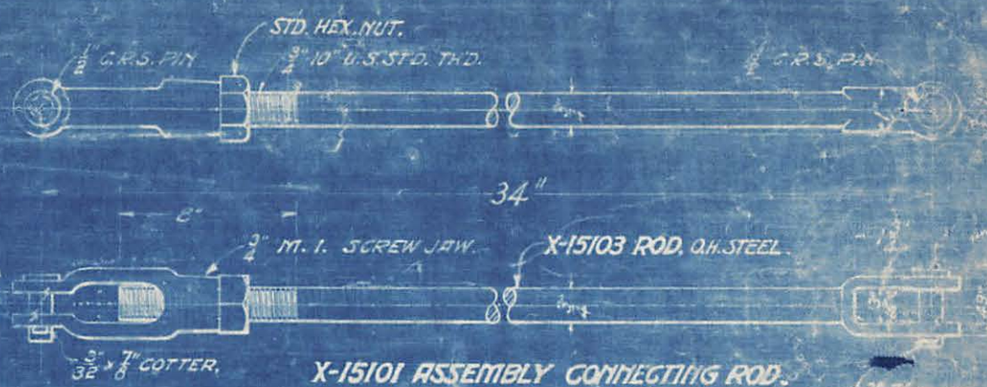
N. Y. C. R. R.
SIGNAL DEPARTMENT
CONCRETE CROSSING BELL POST
ALBANY, JUNE 16 - 1913.

W. H. Elliott 4/24/13
SIGNAL ENGINEER.

X-15
REV.
2

11-20-3





X-15101 ASSEMBLY CONNECTING ROD.

OAK PLANK 1 3/4" X 8 3/4" DRESSED FOUR SIDES, EXTENDING FULL LENGTH OF MACHINE, SHALL BE FASTENED WITH 3/4" BOLTS OR LAG SCREWS, WITH WASHERS, ACCORDING TO STYLE OF MACHINE SUPPORT.

COUNTERBORE 3/4" DEEP.

1 1/2"

N. Y. C. R. R.

SIGNAL DEPT. — BUFFALO AND EAST

APPLICATION OF TIME RELEASE TO STYLE "A" MACHINE.

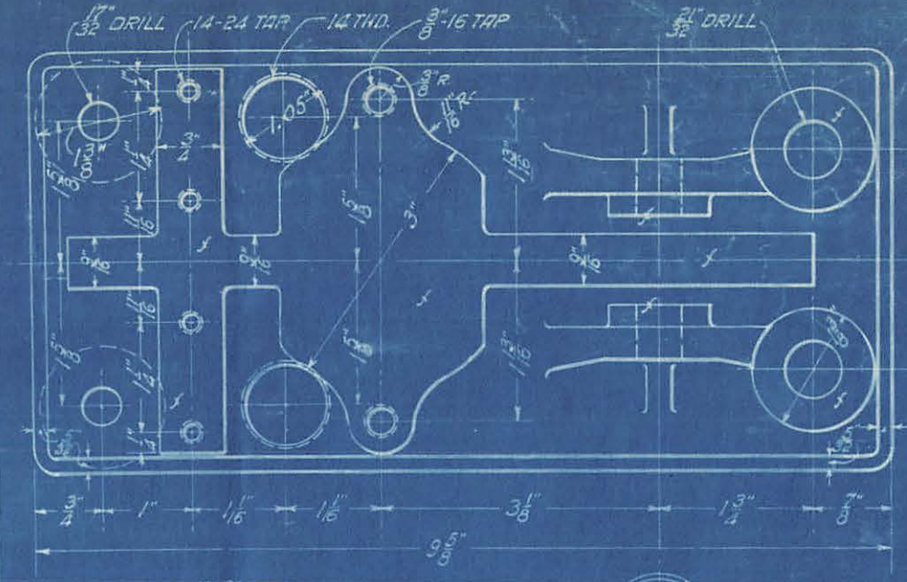
SCALES 1 1/2" & 3" = 1'-0" ALBANY NOV. 6, 1913.

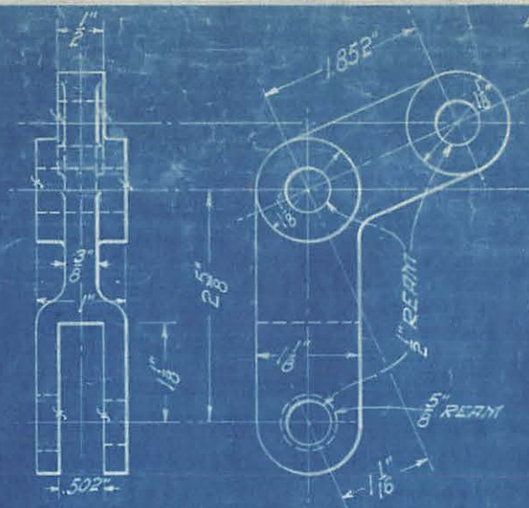
W. H. Elliott 12/20/13
SIGNAL ENGR.

4-12-18

X-153
REV. 2

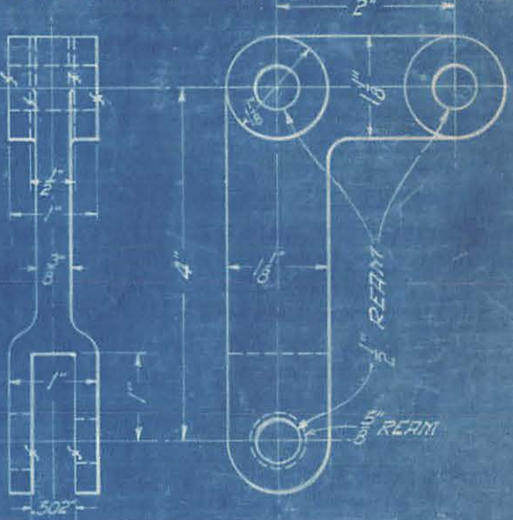
3-SHEETS
SHEET 1





X-15315, CRANK MALL. IRON 1-REQ'D.
FOR ROCKER CONNECTION.

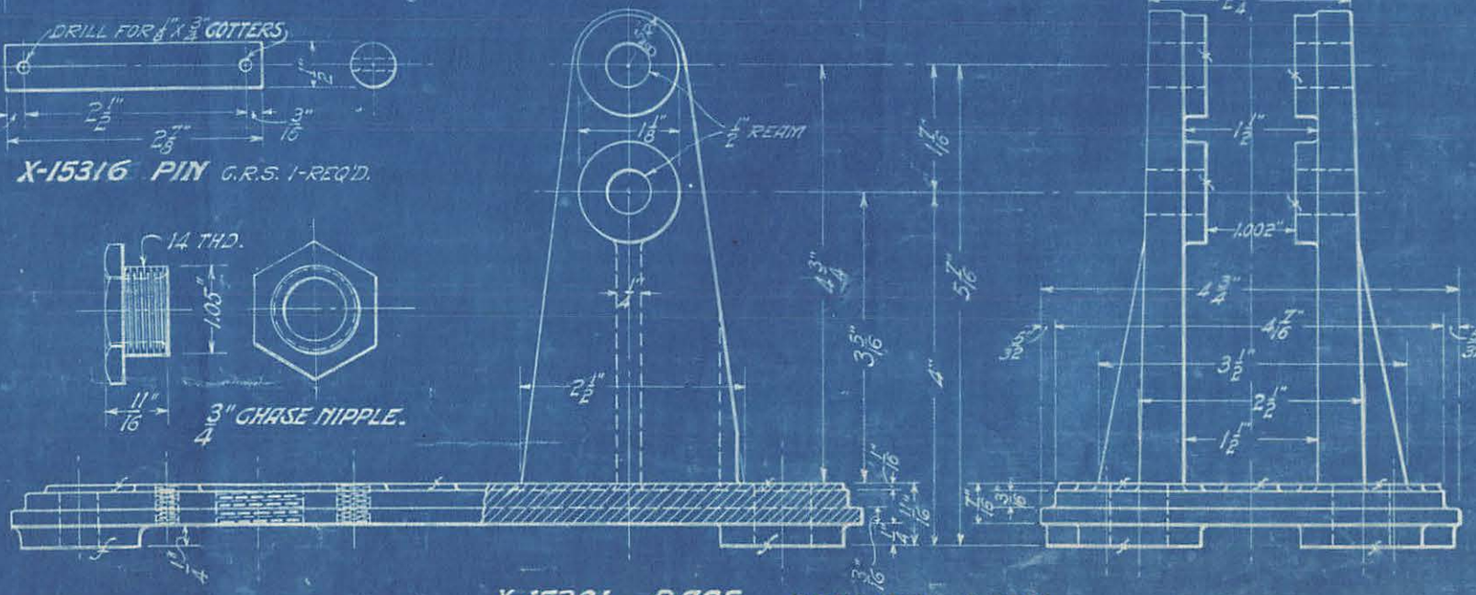
X-15317, PIN C.R.S. 1-REQ'D.



X-15314, CRANK MALL. IRON 1-REQ'D.
FOR TAPPET CONNECTION

X-15316 PIN C.R.S. 1-REQ'D.

3/4" CHASE NIPPLE.



X-15301, BASE GRAY IRON 1-REQ'D.

N.Y.C.R.R.

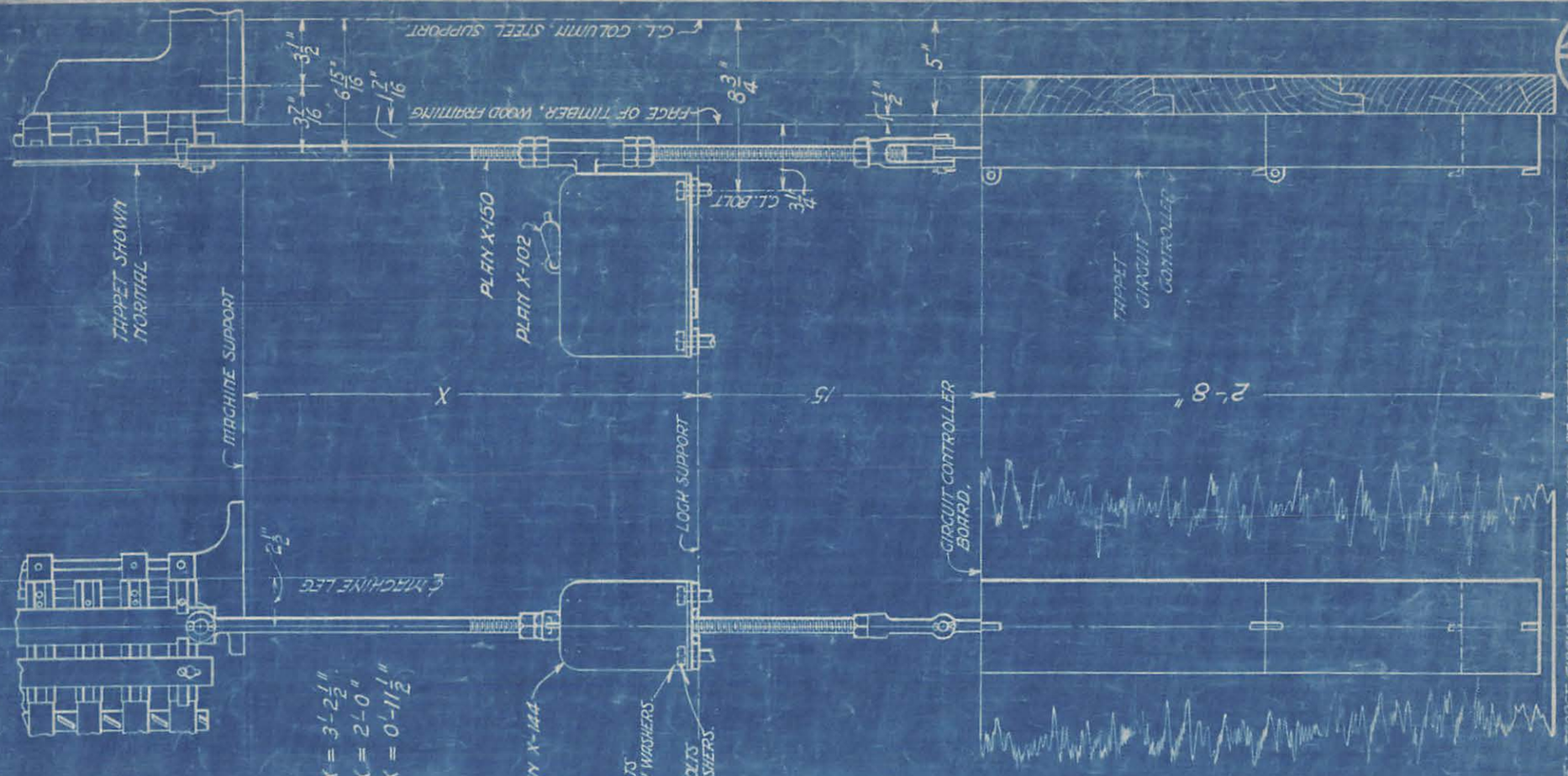
SIGNAL DEP'T.

UNIVERSAL LOCK DETAILS

HALF SIZE ALBANY FEB. 17 1914.

W.H. Elliott 6/11/14
SIGNAL ENG'R.

X-154
REV.


℄ C.L. COLUMN. STEEL SUPPORT.
FACE OF TIMBER. WOOD FRAMING
TAPPET SHOWN NORMAL
PLAN X-150
PLAN X-102
C.L. BOLT
MACHINE SUPPORT
LOCK SUPPORT
TARGET
CIRCUIT CONTROLLER
CIRCUIT CONTROLLER BOARD.
℄ MACHINE LEG
PLAN X-144
X
15"
2'-8"
4 SPACE LOCKING PLATE. X = 3'-2½"
9 " " " X = 2'-0"
14 " " " X = 0'-11½"
FOR STEEL FRAMING;
4- ⅝" X 2" SQ. HD. THROH. BOLTS WITH HEX. NUTS & LOCK WASHERS.
FOR WOOD FRAMING;
4- ⅝" X 5½" SQ. HD. THROH. BOLTS WITH HEX. NUTS & WASHERS.

NOTE: TAPPET CIRCUIT CONTROLLER SHALL BE FASTENED TO CONTROLLER BOARD WITH 1"x3" STONE BOLTS, EXCEPT WHERE OBSTRUCTIONS ARE ENCOUNTERED, WHEN #23 x 1¾ FLAT HD WOOD SCREWS SHALL BE USED.

N.Y.C.R.R.

SIGNAL DEP'T.

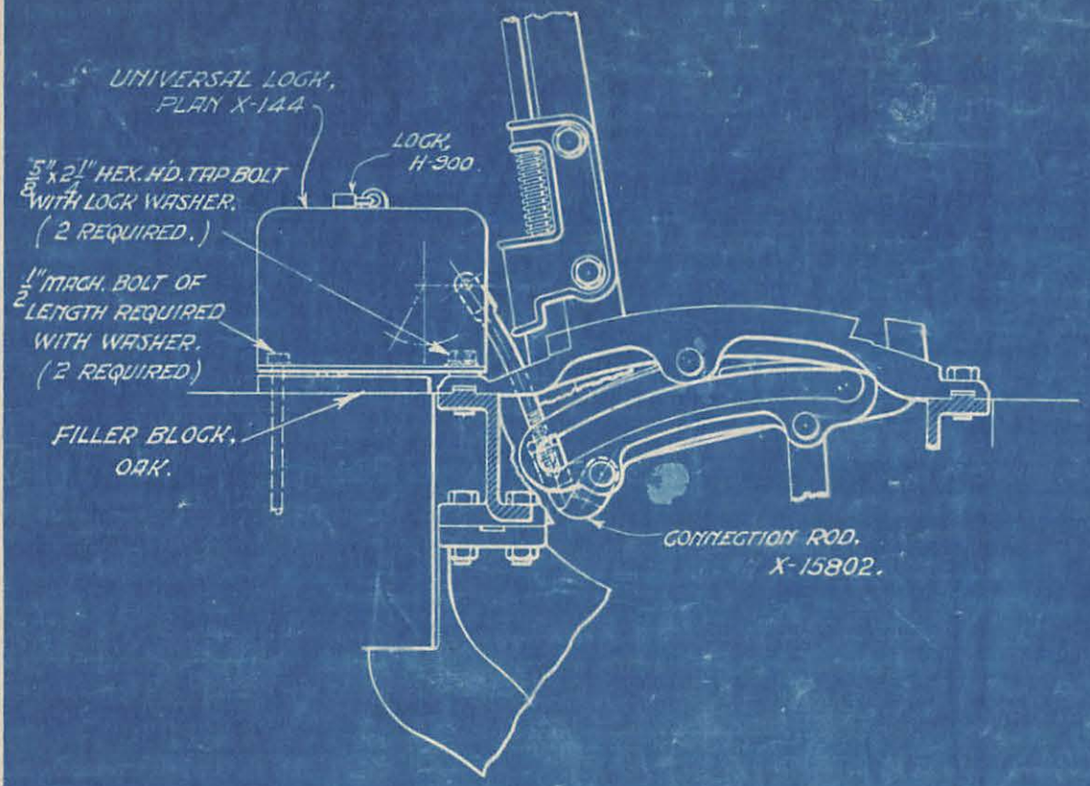
LOCK AND CONTROLLER CONNECTION TO TAPPET OF STYLE "A" MACHINE

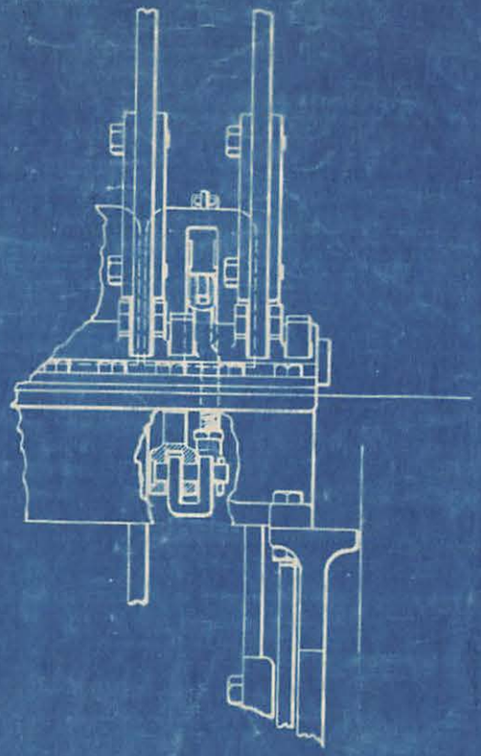
SCALE 1½"=1'-0" ALBANY OCT. 28, 1914.

W. H. Elliott 10/27/14
SIGNAL ENG'R.

X-155
REV.
1

4-21-19


UNIVERSAL LOCK, PLAN X-144
LOCK, H-900
5/8" x 2 1/2" HEX. HD. TAP BOLT WITH LOCK WASHER. (2 REQUIRED.)
1/2" MACH. BOLT OF LENGTH REQUIRED WITH WASHER. (2 REQUIRED.)
FILLER BLOCK, OAK.
CONNECTION ROD, X-15802.



N. Y. C. R. R.

SIGNAL DEP'T.

UNIVERSAL LOCK.

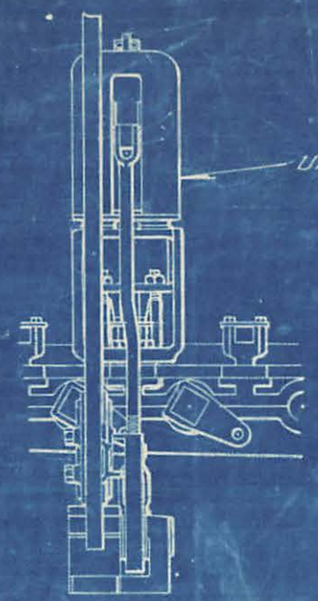
APPLICATION TO ROCKER OF STYLE "A" MACHINE.

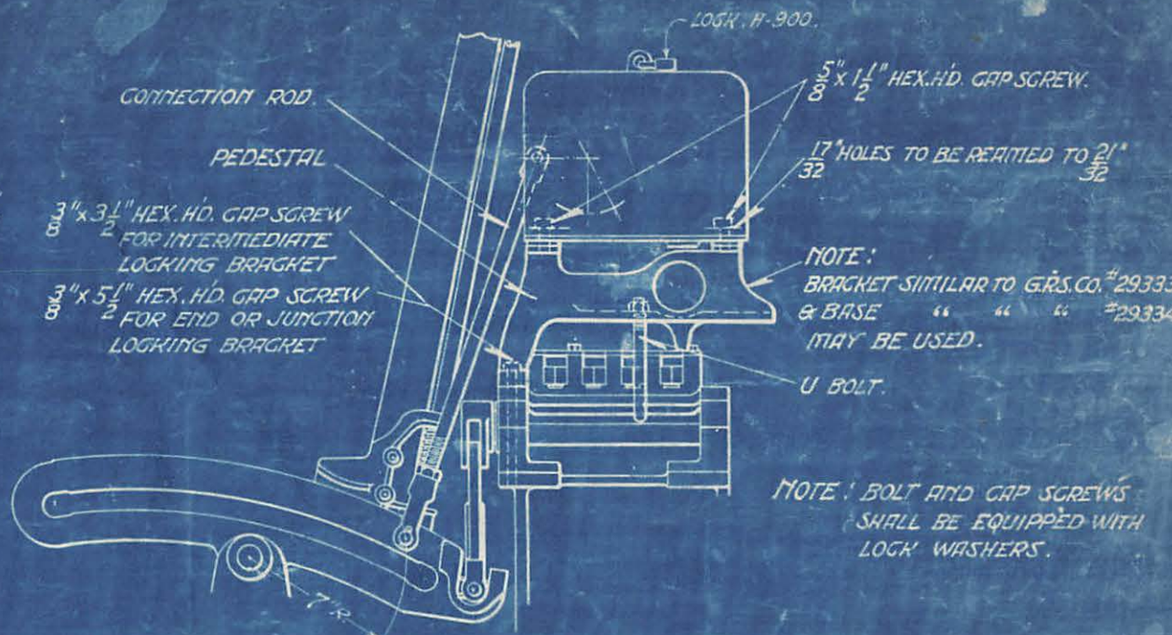
SCALE 1 1/2" = 1'-0" ALBANY, NOV. 5TH 1914.

W. H. Elliott, "/9/
SIGNAL ENG

X-156
REV.

4-21-1




LOCK. H-900.
CONNECTION ROD.
PEDESTAL
3/8"x3 1/2" HEX. HD. CAP SCREW FOR INTERMEDIATE LOCKING BRACKET
3/8"x5 1/2" HEX. HD. CAP SCREW FOR END OR JUNCTION LOCKING BRACKET
5/8"x1 1/2" HEX. HD. CAP SCREW.
17/32" HOLES TO BE REAMED TO 21/32"
NOTE:
BRACKET SIMILAR TO G.R.S. CO. #29333
& BASE " " " #29334
MAY BE USED.
U BOLT.
NOTE: BOLT AND CAP SCREWS SHALL BE EQUIPPED WITH LOCK WASHERS.

PARTS REQ'D. TO FASTEN UNIVERSAL LOCK TO S&F MACHINE.	
NO. REQ'D.	NAME
1	PEDESTAL (SIMILAR TO HALL SW. & SIG. CO. # 31442).
1	U BOLT (" " " # 31456).
1	CONNECTION ROD COMPL. X-15806.
4	5/8" X 1 1/2" HEX. HD. CAP SCREW
2	3/8" X 5 1/2" " " " " (AS REQUIRED).
2	3/8" X 3 1/2" " " " " (AS REQUIRED)

N. Y. C. R. R.

SIGNAL DEP'T.

UNIVERSAL LOCK
APPLICATION TO ROCKER OF "S. & F." MACHINE

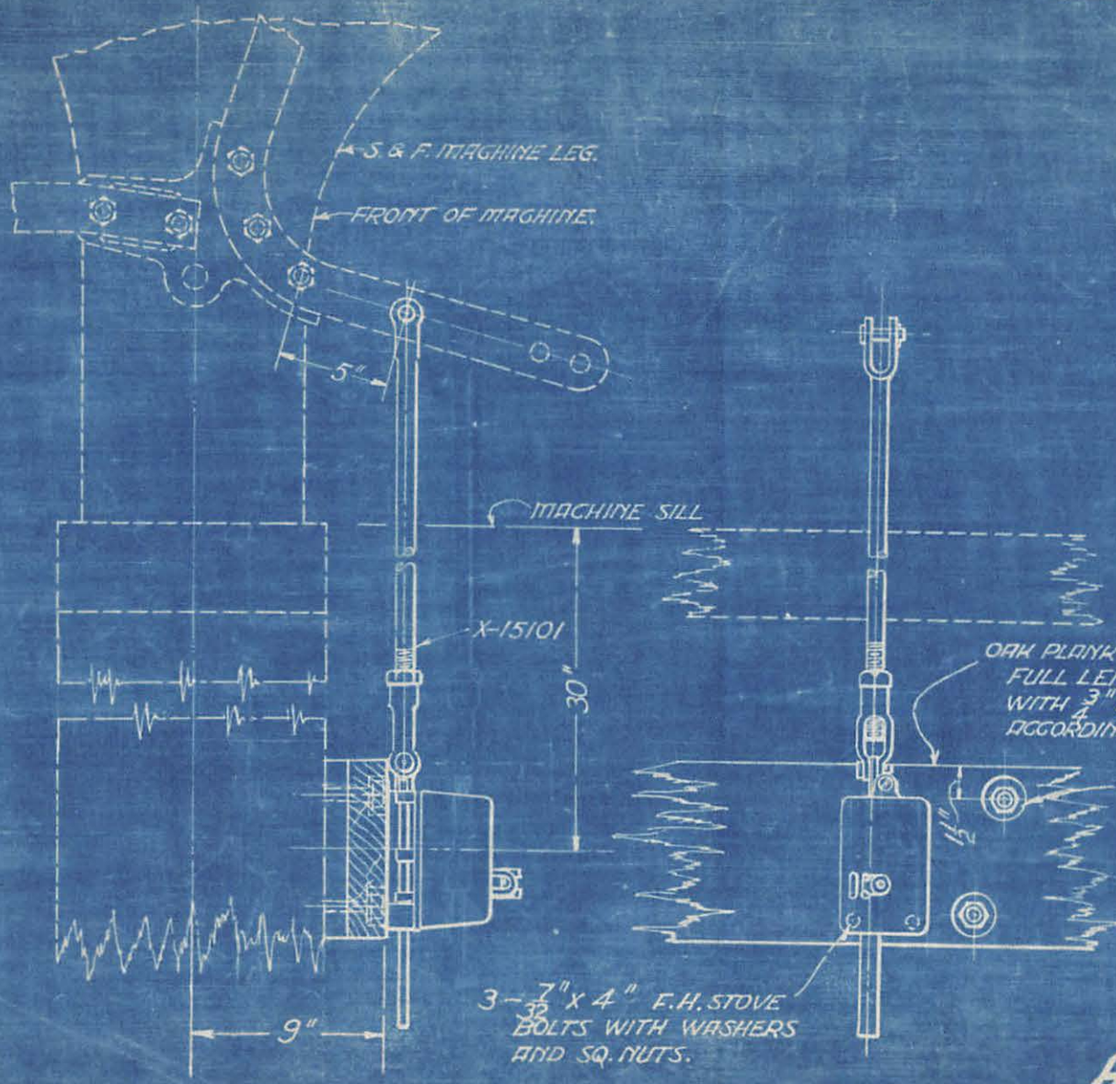
SCALE 1/2" = 1'-0" ALBANY, JULY 10 - 1916.

W. H. Elliott. 7/10/16

SIGNAL ENGR.

X-15
REV
1

11-20-


S. & F. MACHINE LEG.
FRONT OF MACHINE.
5"
MACHINE SILL
X-15101
30"
9"
3 - 7/32" x 4" F.H. STOVE BOLTS WITH WASHERS AND SQ. NUTS.
OAK PLANK 1 3/4" x 8 3/4" DRESSED FOUR SIDES, EXTENDING FULL LENGTH OF MACHINE, SHALL BE FASTENED WITH 3/4" BOLTS OR LAG SCREWS, WITH WASHERS, ACCORDING TO STYLE OF MACHINE SUPPORT.
COUNTERBORE 3/4" DEEP.
1 1/2"

N.Y.G.R.R.

SIGNAL DEPT. – BUFFALO AND EAST

TIME RELEASE

APPLICATION TO "S. & F." MACHINE

SCALE 1 1/2" = 1'-0" ALBANY MAR. 13 1914.

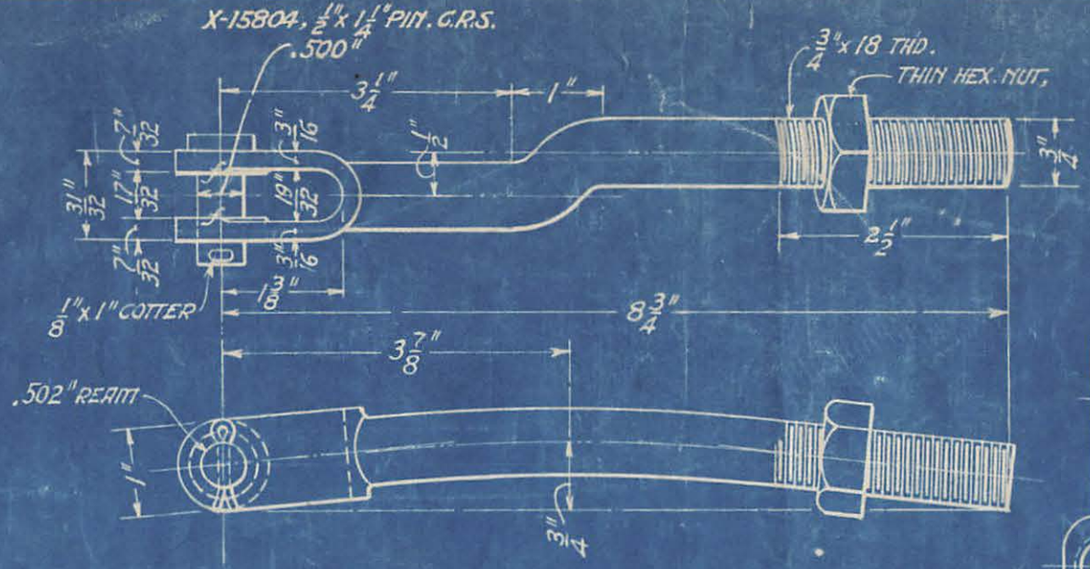
W.H. Elliott. 9/24/17.

SIGNAL ENGR.

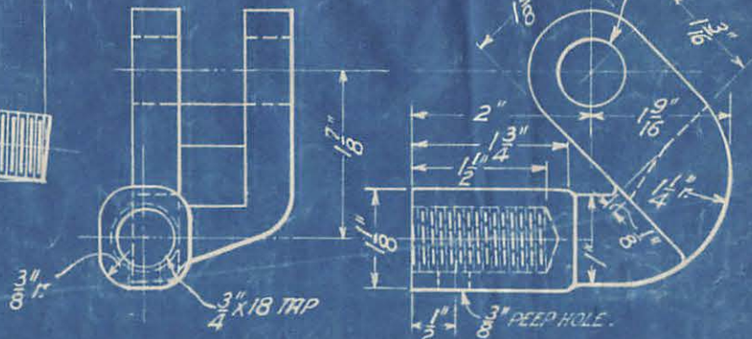
DEC 7 1931
U. S. S. & W. CO.

DEC 7 1931
A. M.
INDUS. ATTENTION

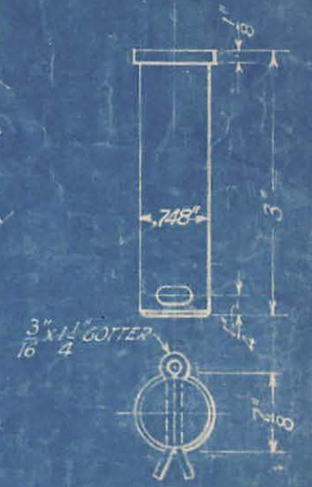
X-158
REV. 2
4-21-19



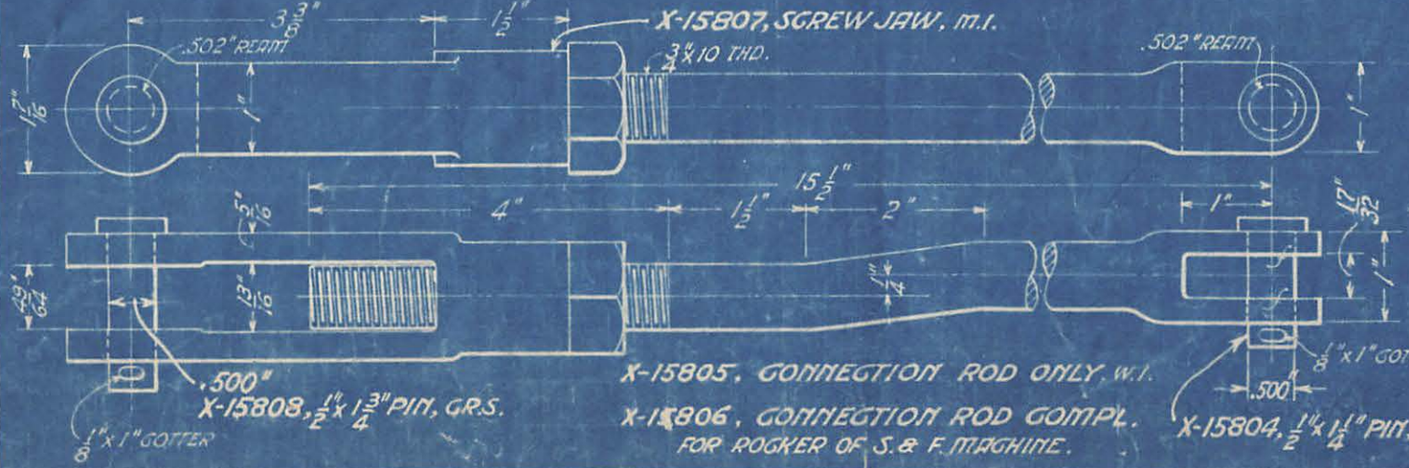
X-15801, CONNECTION ROD ONLY. W.I.
X-15802, CONNECTION ROD COMPL.
FOR ROCKER OF STYLE "A" MACHINE.



X-15803, JAW, M.I.



X-15809, PIN. GR.S.



X-15808, 1/2" x 1 3/4" PIN, GR.S.

X-15805, CONNECTION ROD ONLY. W.I.
X-15806, CONNECTION ROD COMPL.
FOR ROCKER OF S. & F. MACHINE.

X-15804, 1/2" x 1 1/4" PIN, GR.S.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

CONNECTION RODS UNIVERSAL LOCK.

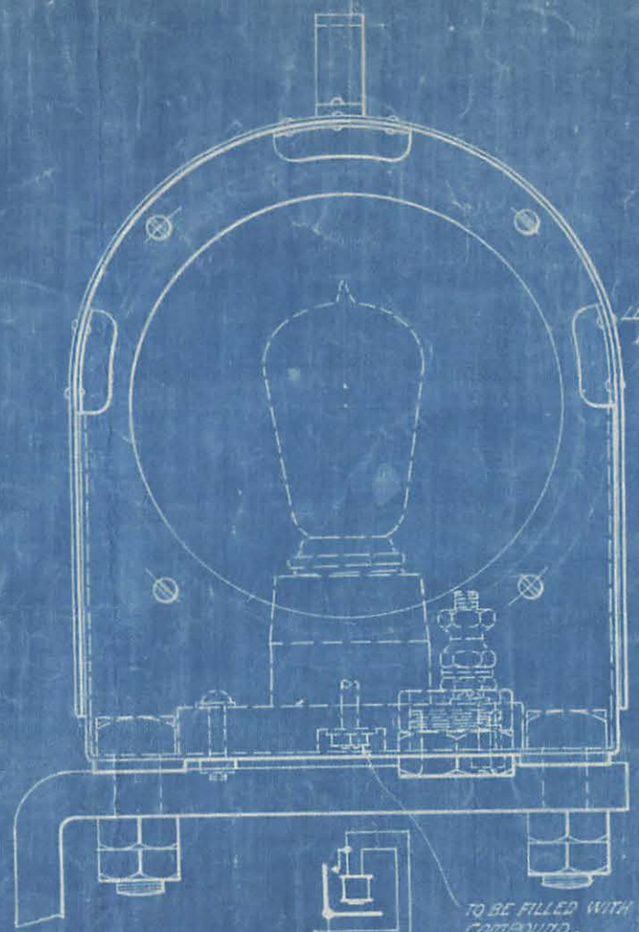
SCALE: HALF SIZE. ALBANY, NOV. 5TH 1914.

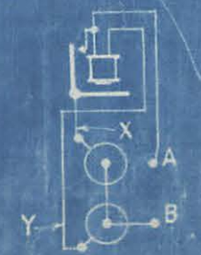
W. H. Elliott 11/9/14
SIGNAL ENGINEER.

3-29-18

X-161
REV. 5

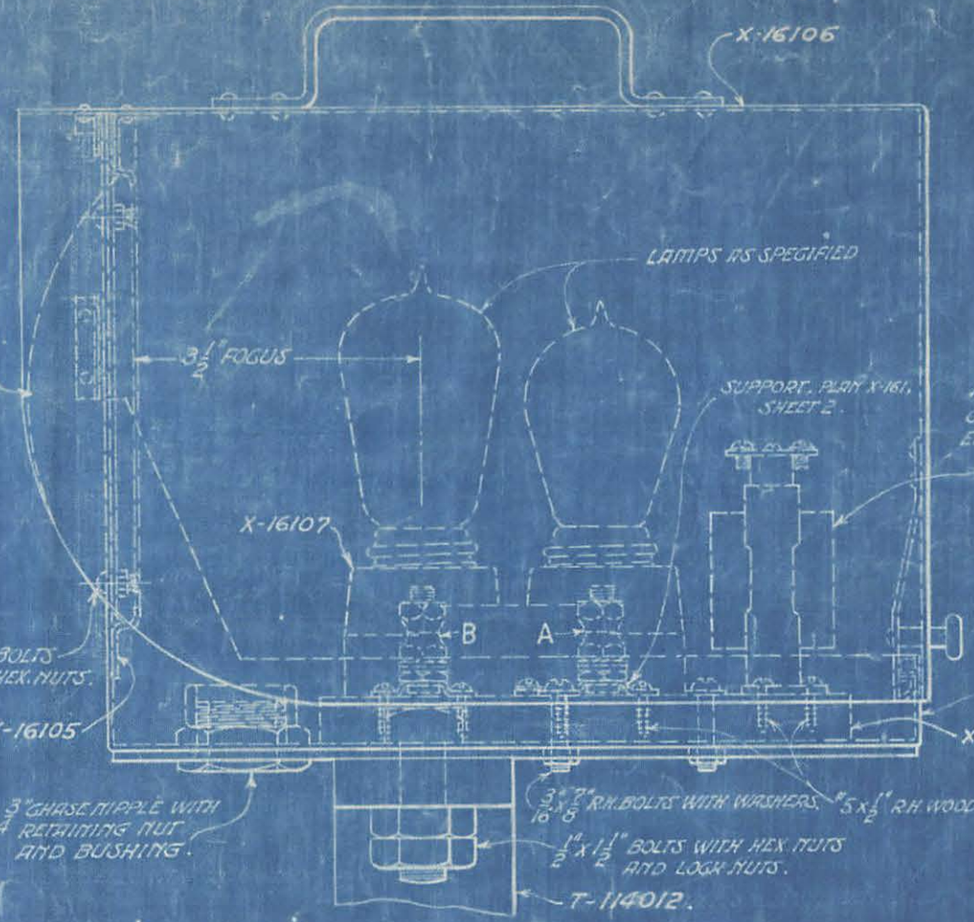
SHEET-1





CIRCUIT

WIRES X AND Y TO BE OF SUFFICIENT LENGTH FOR TRANSPOSITION.



TO BE FILLED WITH COMPOUND.

NOTE:
CHARACTERISTICS OF ELECTRICAL ENERGY TO BE SPECIFIED.

UNIFIED ELECTRIC CO'S AUTOMATIC CUT-IN RELAY.
10 VOLT, X-16102
110 VOLT, X-16103

SIGNAL LAMP COMPL. WITH 10 V. 60 CYCLE CUT-IN RELAY, X-16108.
" " " " 110 V. 60 " " " " , X-16109.
" " " WITHOUT LAMP BASE, BASE BLOCK OR CUT-IN RELAY, X-161010.
CUT-IN RELAY, LAMP BASE, BASE BLOCK, SCREWS AND BOLTS FOR MOUNTING, X-161011.

N. Y. C. R. R.
SIGNAL DEPARTMENT.

ELECTRIC SIGNAL LAMP.

SCALE: HALF SIZE, ALBANY, MARCH 23 1915.

W. H. Elliott 4/2/15
SIGNAL ENGINEER.

E. H. L.
S. V.
MCC.
N. L. S.
E. A. W.
F. K. M.
E. A. E.

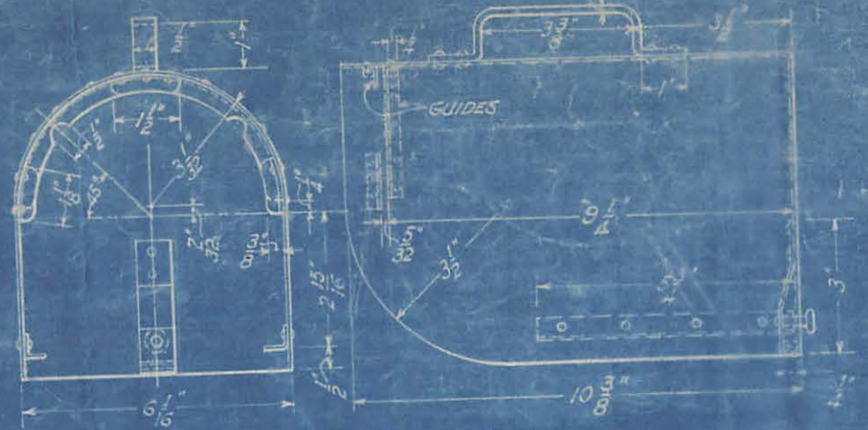
RECEIVED
APR 15 1918

APR 16 1918

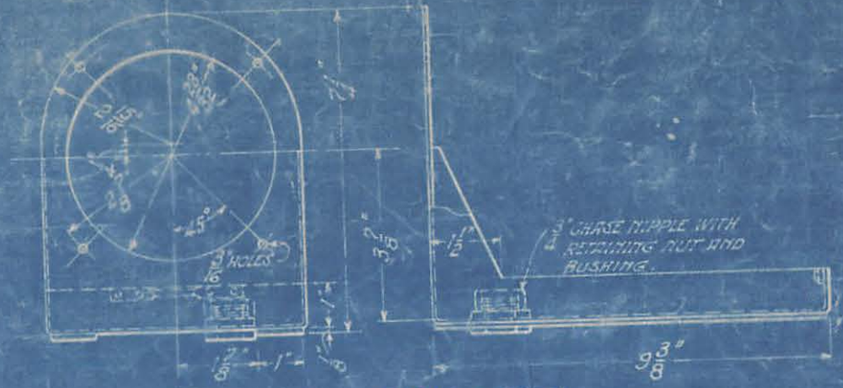
3-29-15

X-161 REV. 5

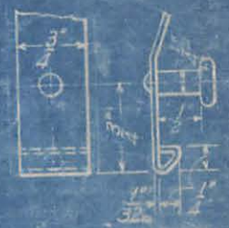
SHEET 2



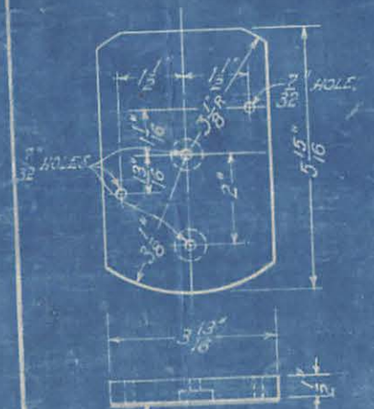
COVER, X-16106.



BODY, X-16104

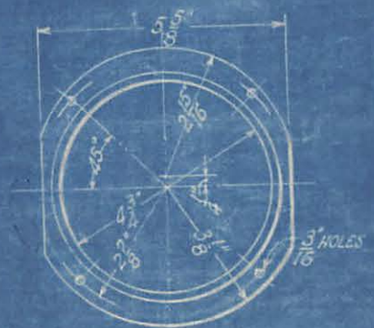


DETAIL OF LATCH.

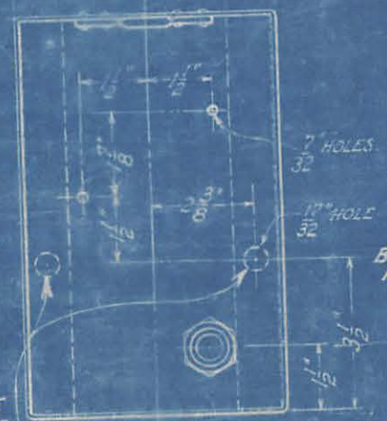


BASE BLOCK, X-16101
MAPLE.

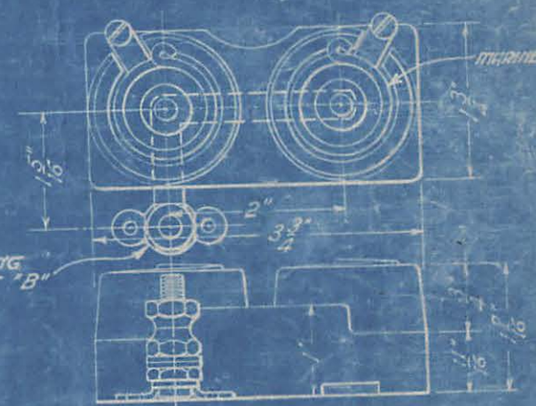
OIL GAMBRIG TO BE GLUED TO BOTTOM OF BASE BLOCK AFTER LAMP BASE HAS BEEN FASTENED.



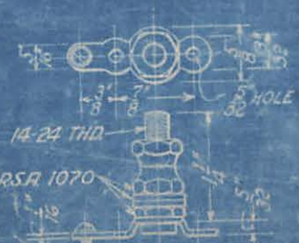
LENS RING, X-16105



BOLT HOLES TO BE DRILLED ON GROUND AFTER LAMP IS ADJUSTED IN PLACE.



LAMP BASE, X-16107.
(GLAZED PORCELAIN)
SCALE: HALF SIZE.



BINDING POST "A".
HALF SIZE.

NOTE COVER AND BODY, EXCEPTING GUIDES, TO BE MADE OF #16 U.S.S.G. GALV. IRON. GUIDES AND LENS RING TO BE MADE OF #18 U.S.S.G. GALV. IRON.

N. Y. C. R. R.

SIGNAL DEPARTMENT

ELECTRIC SIGNAL LAMP DETAILS.

SCALE: 3"=1'-0" ALBANY, MARCH 23 1915.

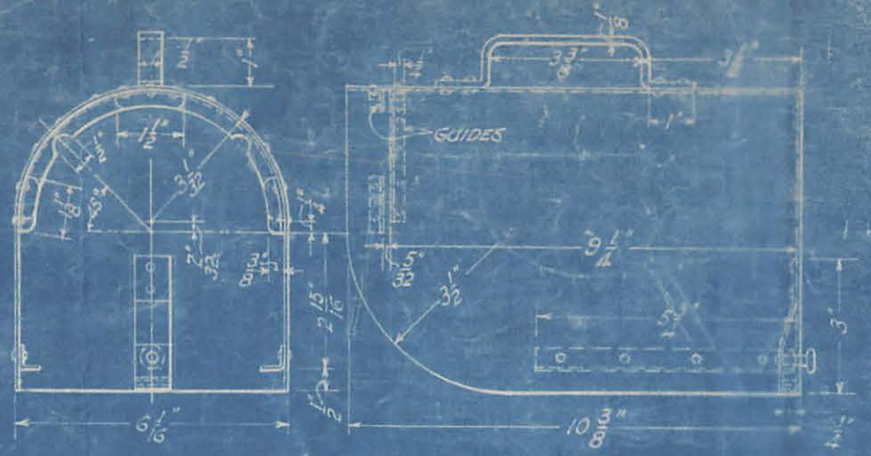
W.H. Elliott 4/2/15.
SIGNAL ENGINEER.

W.H. Elliott 9/21/21.
SIGNAL ENGINEER.

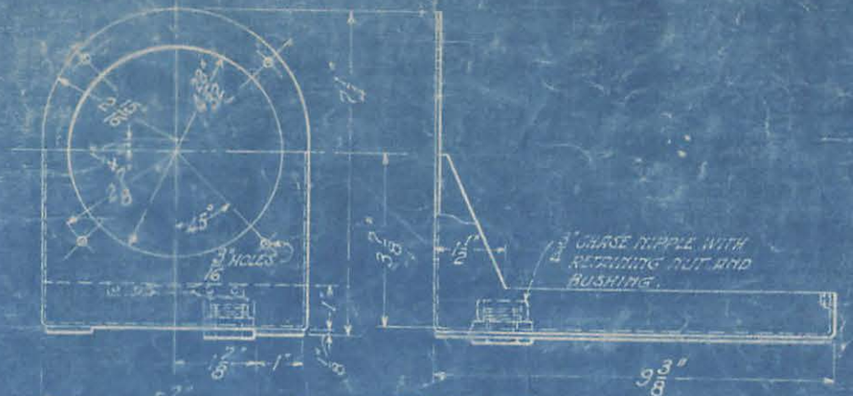
3-29-18.

X-161 REV. 5

SHEET-2

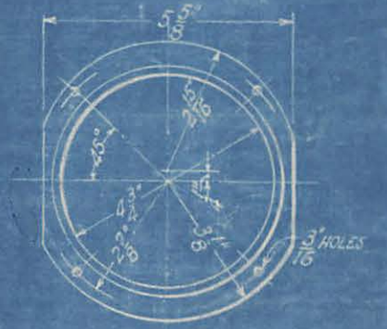


COVER, X-16106.



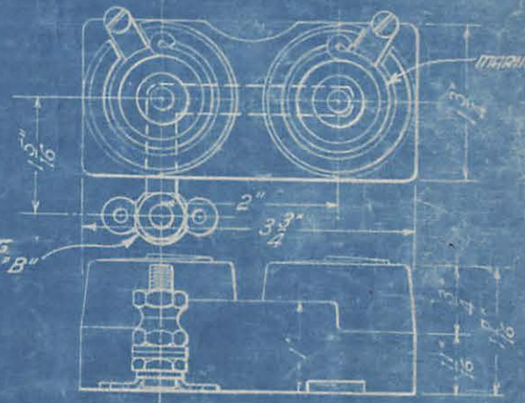
BODY, X-16104

DETAIL OF LATCH.

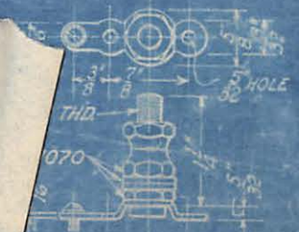


LENS RING, X-16105

BOLT HOLES TO BE DRILLED ON GROUND AFTER LAMP IS ADJUSTED IN PLACE.



LAMP BASE, X-16107.
(GLAZED PORCELAIN).
SCALE: HALF SIZE.



NOTE: COVER AND BODY, EXCEPTING GUIDES, TO BE MADE OF 1/16 U.S.S.G. GALV. IRON. GUIDES AND LENS RING TO BE MADE OF 18 U.S.S.G. GALV. IRON.

N. Y. C. R. R.

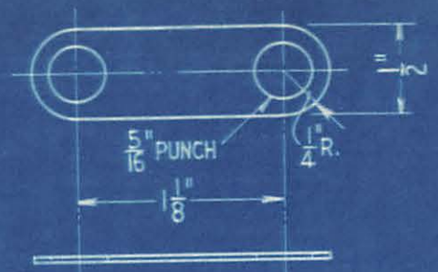
SIGNAL DEPARTMENT.

ELECTRIC SIGNAL LAMP DETAILS.

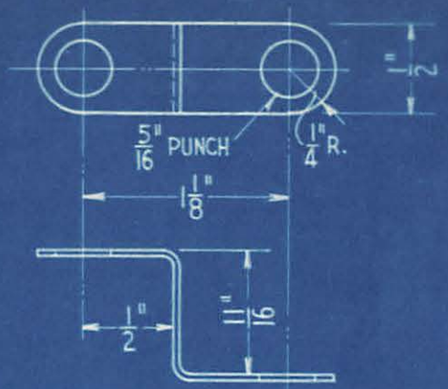
SCALE: 3"=1'0". ALBANY, MARCH 23 1915.

W. H. Elliott. 4/21/15

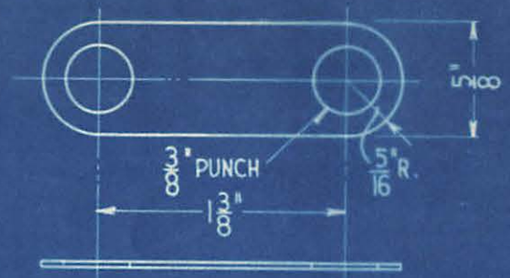
X-162
REV. 3



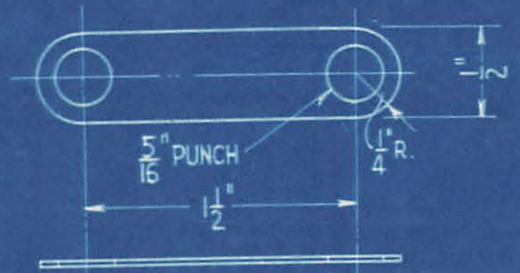
X-16201 FOR RELAY POSTS W, X, Y, Z.
"HALF HARD" COPPER - NO. 18 A.W.G.



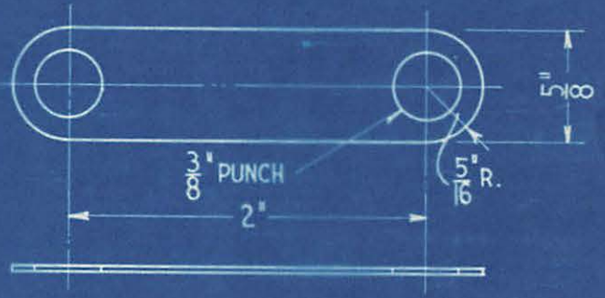
X-16202 FOR RELAY POSTS A, C AND B, D.
"HALF HARD" COPPER - NO. 18 A.W.G.



X-16203 FOR STYLE "G" SWITCH CIRCUIT CONTROLLERS.
"HALF HARD" COPPER - NO. 18 A.W.G.



X-16204 BUS FOR TERMINALS AND RESISTANCES
"HALF HARD" COPPER - NO. 18 A.W.G.



X-16206 FOR 3 POS. STYLE "H" SWITCH CIRCUIT CONTROLLERS.
"HALF HARD" COPPER - NO. 18 A.W.G.

X-16205 BUS BAR FOR LIGHTNING ARRESTERS.
"HALF HARD" COPPER - NO. 18 A.W.G. - LENGTH AS REQUIRED.

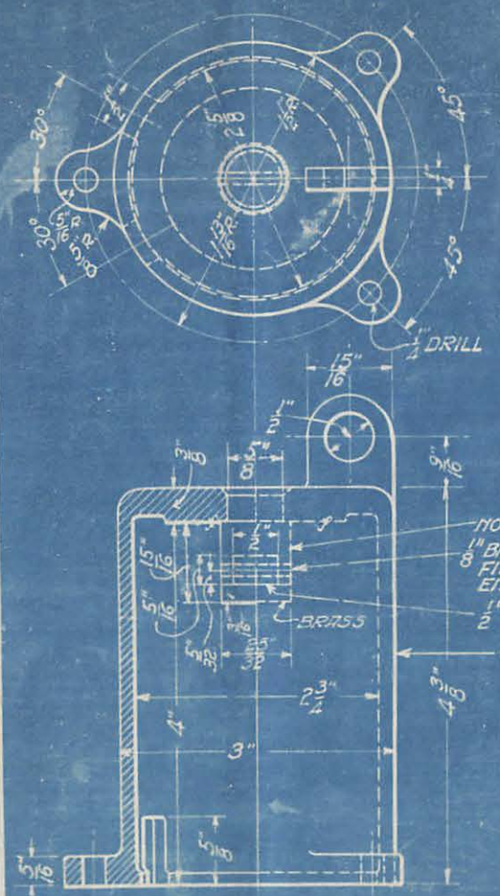
N. Y. C. R. R.
SIGNAL DEPARTMENT
CONNECTING LINKS AND BUS BAR
SCALE: FULL SIZE. ALBANY, AUG. 12-1914.

W. H. Elliott 7/21/21.
SIGNAL ENGINEER.

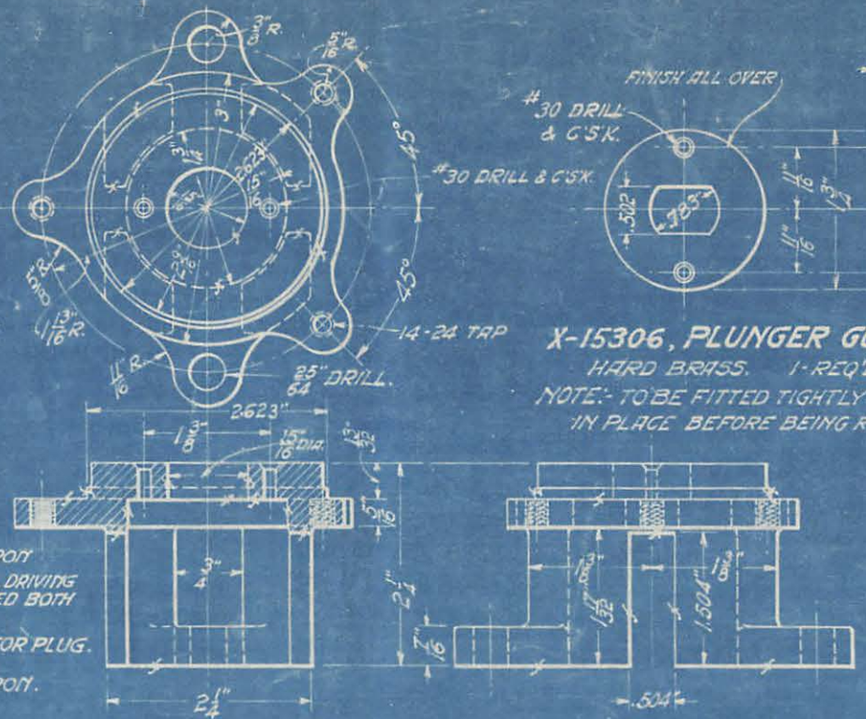
4-12-18

X-153
REV. 2

3-SHEETS
SHEET 3

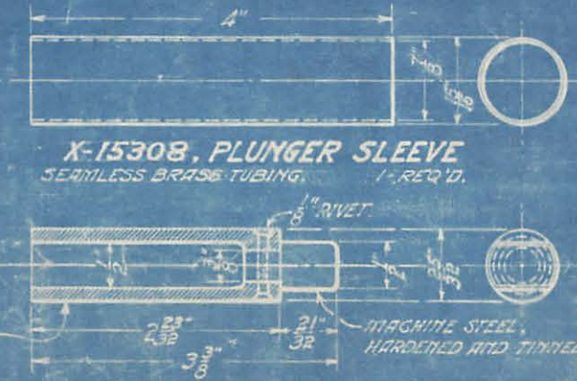


X-15305, COIL CASE
GRAY & NORWAY IRON, AND BRASS



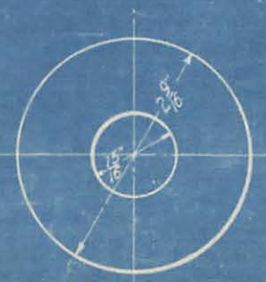
X-15303, COIL BASE GRAY IRON. 1-REQ'D.

X-15306, PLUNGER GUIDE
HARD BRASS. 1-REQ'D.
NOTE:- TO BE FITTED TIGHTLY AND FIRMLY IN PLACE BEFORE BEING RIVETED.

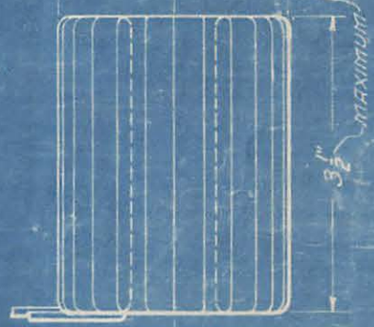


X-15308, PLUNGER SLEEVE
SEAMLESS BRASS TUBING. 1-REQ'D.

X-15307, PLUNGER 1-REQ'D.



X-15318, WASHER
FIBER. 1/16" THICK.
1-REQ'D.



X-15304, COIL (FORM WOUND)
1-REQ'D.

NOTE:- FOR GENERAL DESIGN OF LOCK SEE PLAN X-144.

N.Y.C.R.R.
SIGNAL DEP'T.

UNIVERSAL LOCK DETAILS

HALF SIZE ALBANY FEB. 17, 1914.

W. K. Elliott 4/12/14
SIGNAL ENGR.

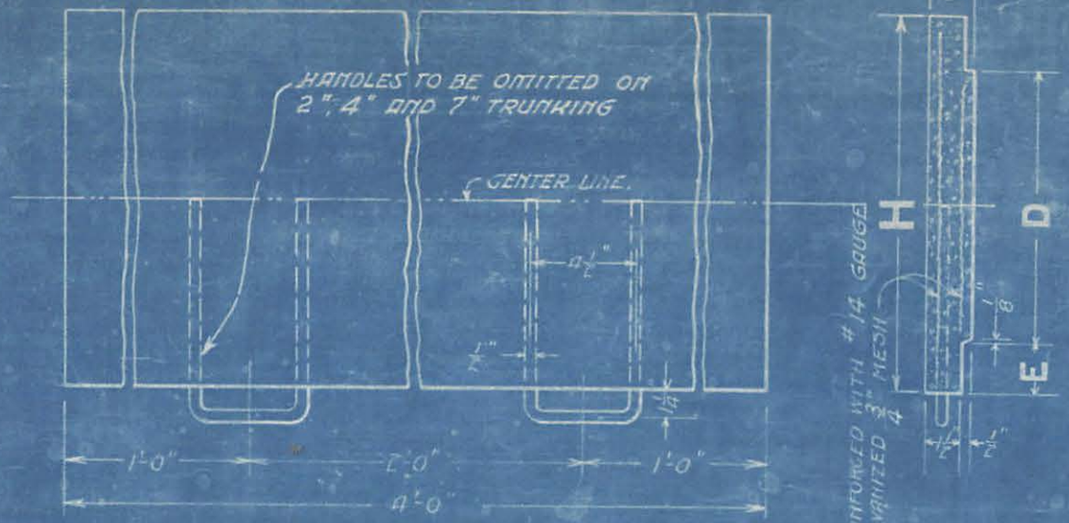
FOR SPECIFICATIONS SEE PLAN Z-74.

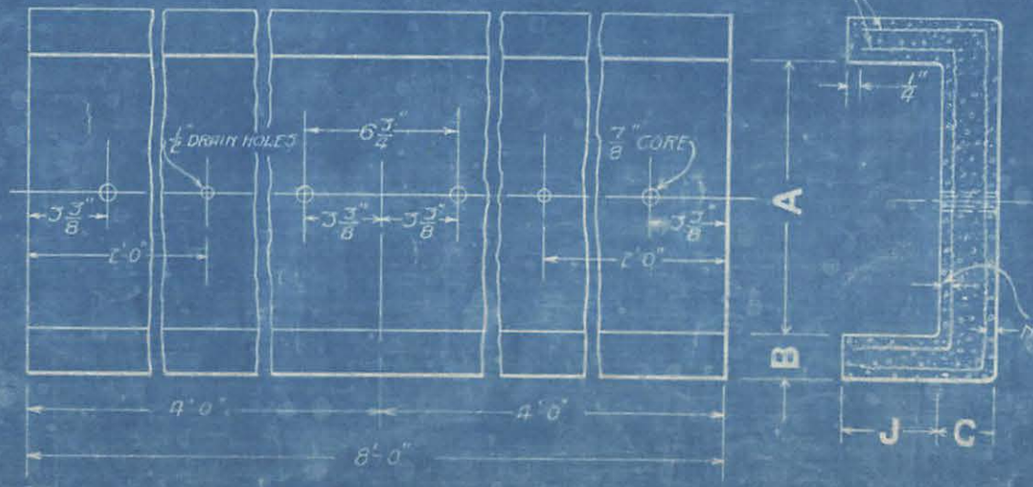
X-163 Rev. 5

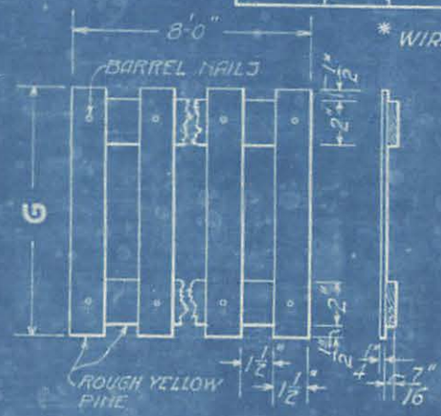
1-15-17

DIMENSIONS								
A	B	C	D	E	F	G	H	J
2"	2	2 1/2"	1 3/4"	2 3/8"	6"	*	6 1/2"	3"
4"	1 1/2"	2"	3 3/4"	1 7/8"	7"	*	7 1/2"	2 1/2"
7"	"	"	6 3/4"	"	10"	6 3/4"	10 1/2"	4 3/8"
10"	2"	2 1/2"	9 3/4"	2 3/8"	14"	9 3/4"	14 1/2"	"
12"	"	"	11 3/4"	"	16"	11 3/4"	16 1/2"	"
14"	"	"	13 3/4"	"	18"	13 3/4"	18 1/2"	"
16"	"	"	15 3/4"	"	20"	15 3/4"	20 1/2"	"

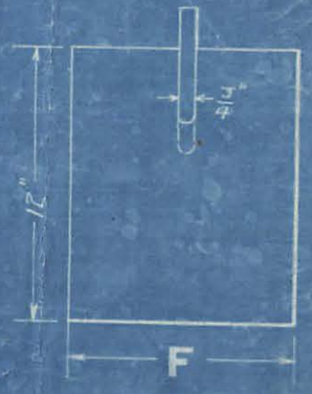
* WIRE RACK NOT REQUIRED.

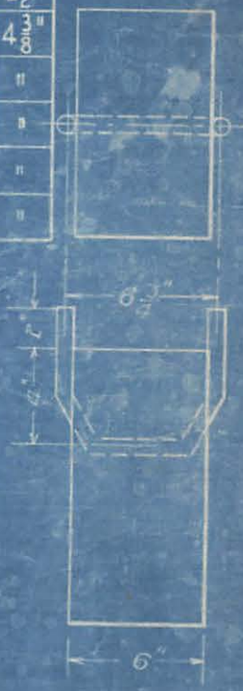






WIRE RACK





TRUNKING FOUNDATION.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

CONCRETE TRUNKING.

SCALE: 1 1/2" = 1'-0" ALBANY, MAR 1ST 1915.

Wm Eeis

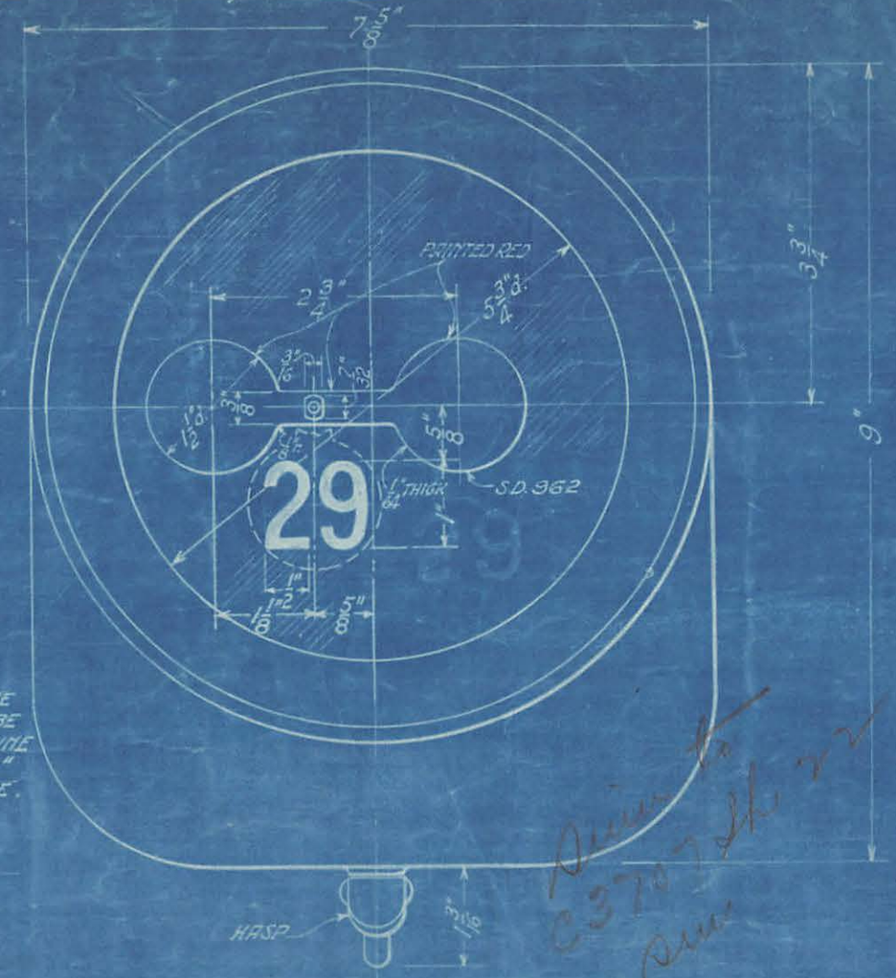
RECEIVED
JAN 29
1917
U. S. PATENT OFFICE

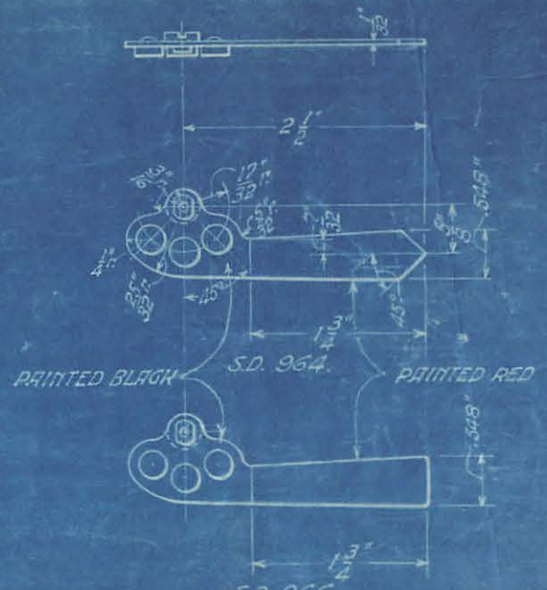
REC'D
JAN 29
1917
THE U. S. PATENT OFFICE

X-164
REV. 2

7-18-16

DISC INDICATOR COMPLETE, S.D. 963.
REAR HOME INDICATOR COMPLETE, S.D. 965.
HOME INDICATOR COMPLETE, S.D. 967.





NOTE: FOR DISC INDICATORS, NUMBERS SHALL BE LOCATED AS SHOWN.
FOR HOME OR REAR HOME INDICATORS, NUMBERS SHALL BE LOCATED ON VERTICAL CENTER LINE OF FACE WITH TOP OF FIGURE 1" BELOW HORIZONTAL CENTER LINE.

NOTES: INDICATOR DISC AND BLADES TO BE MADE OF ALUMINUM.
INDICATOR TO BE WITHOUT CONTACTS, RESISTANCE TO BE 500 OHMS.
FOR PAINTING, SEE SPECIFICATIONS Z-42, SHEET 2.
FACE TO BE PAINTED ALUMINUM.
LEVER NUMBER OR TRACK CIRCUIT LETTERS TO BE PAINTED IN BLACK ON FACE.

Revised to C37-Sh 27 Rev

INDICATIONS

WITH COILS ENERGIZED, DISC TO BE IN VERTICAL POSITION.
" " DE-ENERGIZED, " " " HORIZONTAL POSITION.
WITH COILS ENERGIZED, REAR HOME BLADE TO BE AT 45° ABOVE HORIZONTAL.
" " DE-ENERGIZED, " " " " 90° " "
WITH COILS ENERGIZED, HOME BLADE TO BE HORIZONTAL
" " DE-ENERGIZED, " " " AT 45° ABOVE HORIZONTAL.

N.Y.C.R.R.

SIGNAL DEPARTMENT

SIGNAL STATION INDICATORS

SCALE: HALF SIZE, ALBANY, SEPT. 24 1914.

W. H. Elliott 10/2/14
SIGNAL ENGINEER.

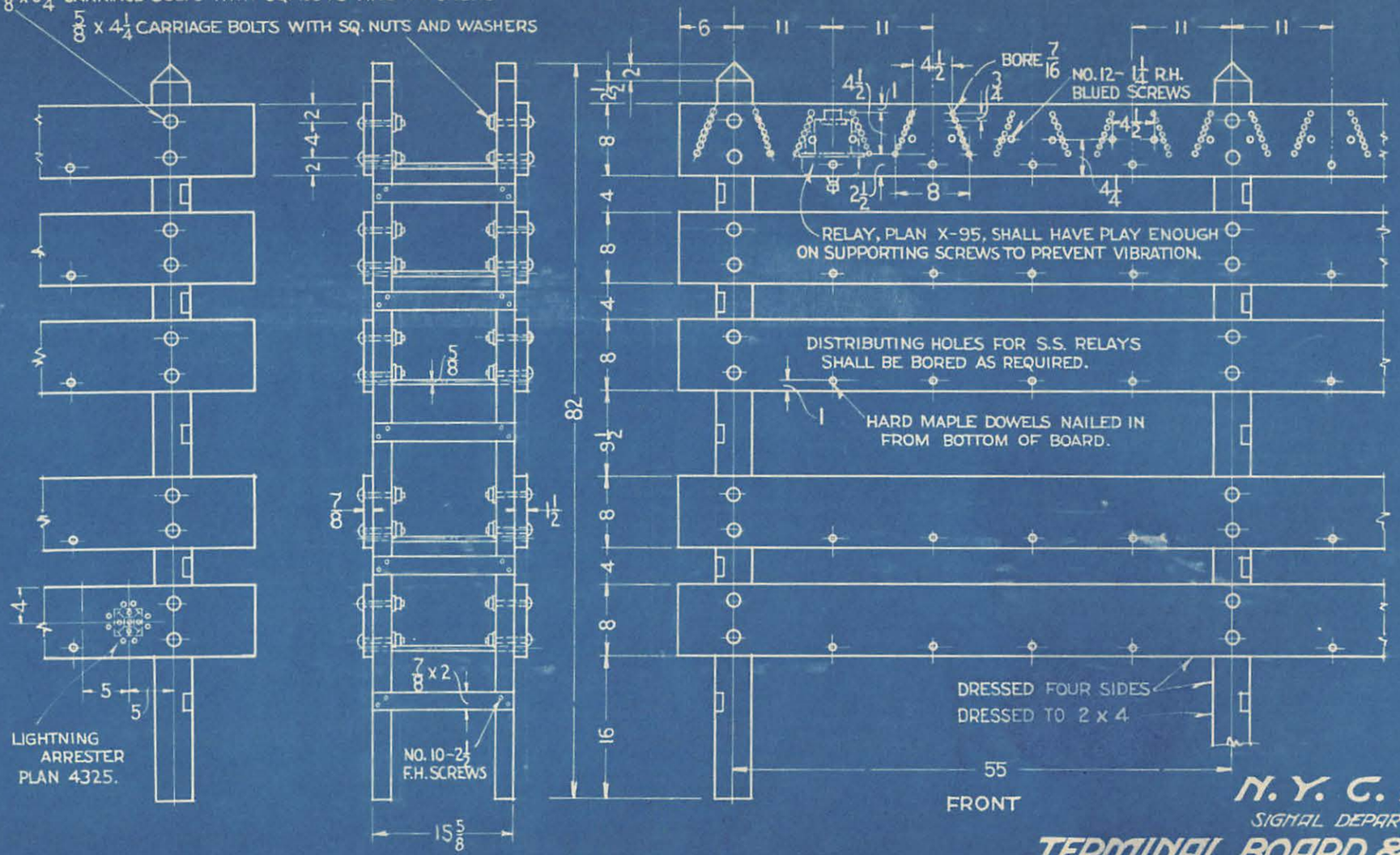
RECD JUL 27 1916
THE U.S. SURVEYOR GEN'L. OFFICE
U.S. SURVEYOR GEN'L. P.R.

RECEIVED
JUL 27 1916
EST. DEPT.

X-165
REV. 2
3-28-24

$\frac{5}{8} \times 3\frac{3}{4}$ CARRIAGE BOLTS WITH SQ. NUTS AND WASHERS

$\frac{5}{8} \times 4\frac{1}{4}$ CARRIAGE BOLTS WITH SQ. NUTS AND WASHERS



⅜ LETTERS CUT IN WITH DIES

LETTERING OF DISTRIBUTING HOLES FOR NEUTRAL RELAYS

NOTE: POSTS SHALL BE OF HEART PINE, BOARDS AND CROSS PIECES OF FIRST QUALITY CYPRESS. FINISH WITH ONE COAT MISSION OAK DYE AND TWO COATS SHELLAC. RACK SHALL BE SECURELY ANCHORED IN PLACE.

0 3 6 9 12 24 36
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT

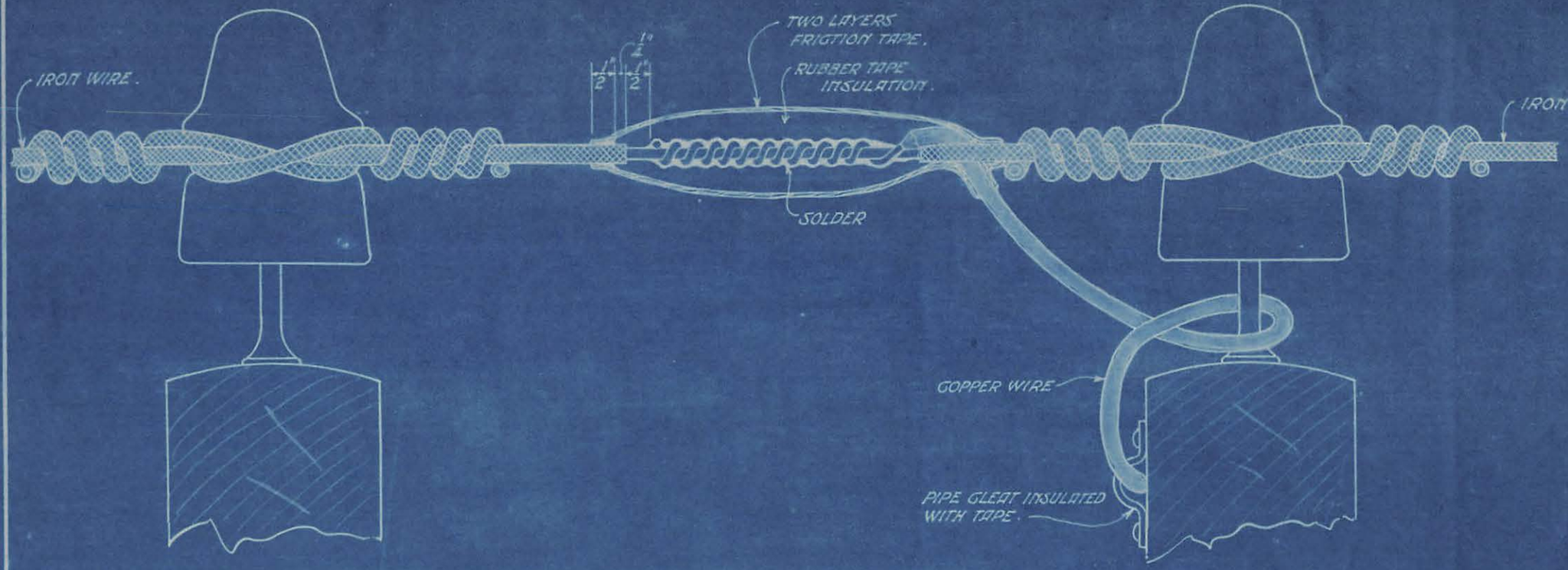
TERMINAL BOARD & RELAY RACK.

ALBANY, APRIL 5-1916

W. H. Elliott 4/5/16

X-166

5-25-15.



NOTE: JOINT AND COVERING SHALL BE AS PER SPECIFIGATIONS 2-53.

N.Y.C.R.R.

SIGNAL DEPARTMENT

BRANCH CONNECTION, TAP TO LINE WIRE.

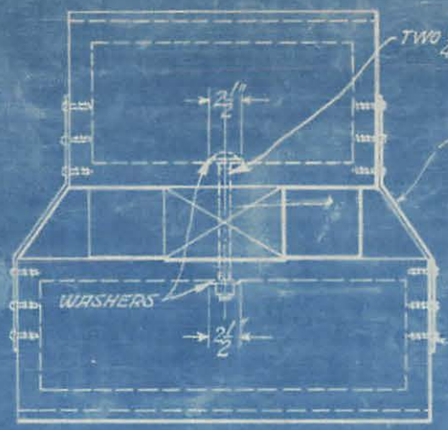
ALBANY, MAY 25th 15.

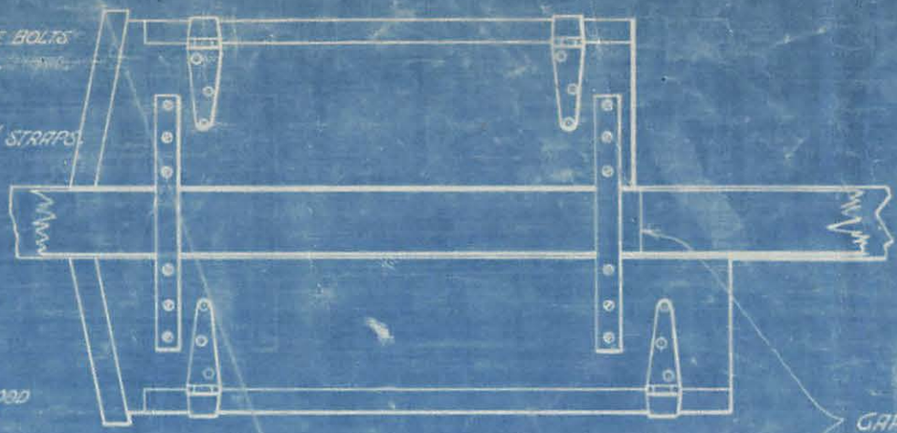
W.H. Elliott 5/27/15.

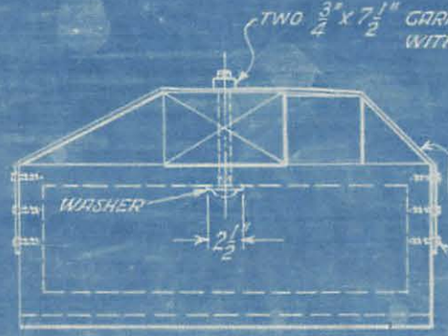
SIGNAL ENGINEER.

X-167
REV. 2

2-12-17







NOTE: $\frac{1}{4}$" x 1" STRAPS MAY BE USED.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

SUPPORTING STRAPS
RELAY & CHARGING SWITCH BOXES.

SCALE: 1" = 1'-0" ALBANY, JUNE 2' 1916.

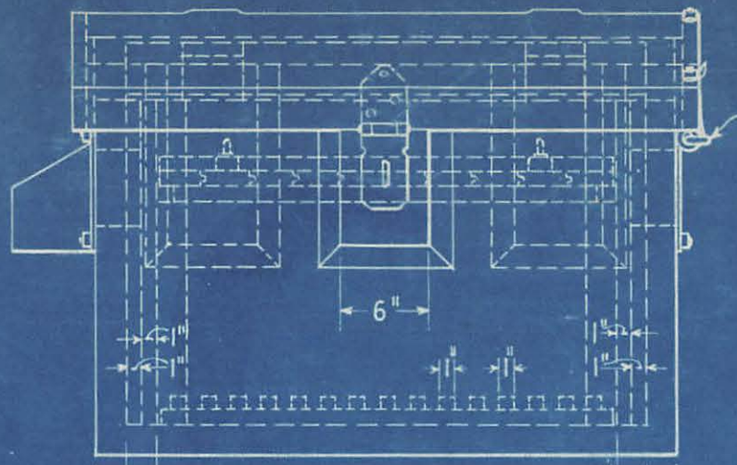
W.H. Elliott
Signal Engineer.

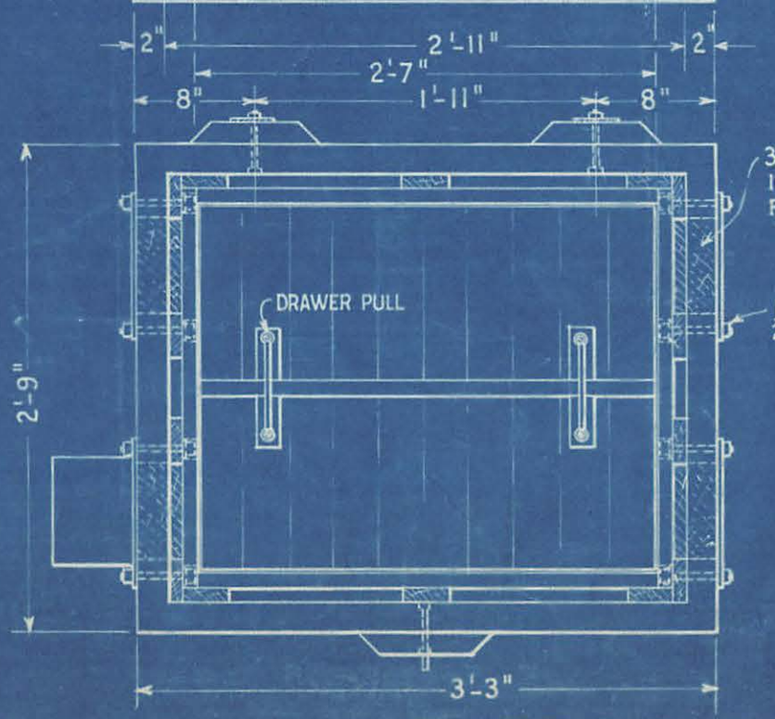
RECEIVED
FEB
19
1917
EST. DEPT.

REC'D
FEB
19
1917

X-168

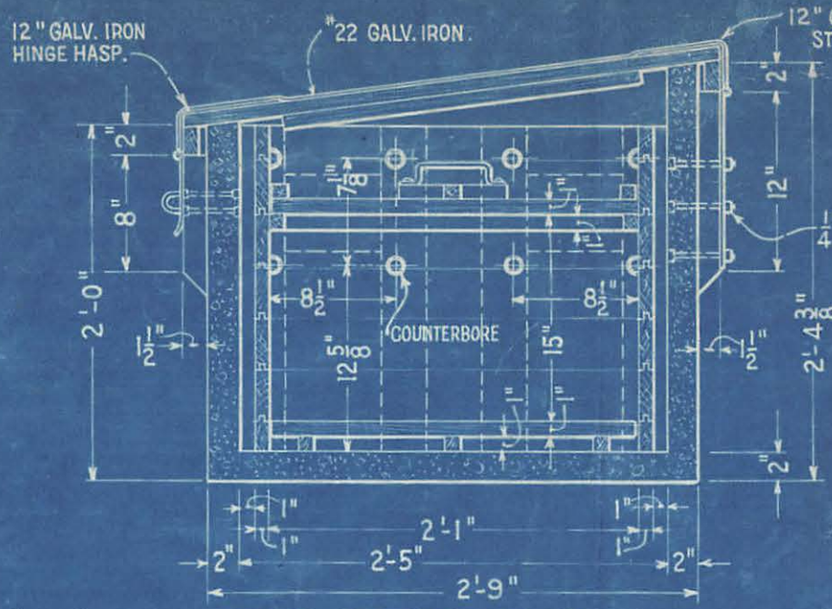
3-14-17





3" BLOCKS FITTED SNUGLY INTO ALL 4 OPENINGS AND FASTENED TO LINING.

$\frac{1}{2}$" X 4$\frac{1}{4}$" IRON BOLTS.



WOOD LINING COMPLETE, S.D. 1129.
CONCRETE BATTERY BOX WITHOUT WOOD LINING, S.D. 1130.
CONCRETE BATTERY BOX WITH WOOD LINING, S.D. 1131.

NOTES:

FOR DETAILS OF FITTINGS SEE PLAN X-113.
ONE OUTLET CAP REQUIRED, LOCATION TO BE DETERMINED IN THE FIELD.

HOLES FOR BATTERY LEADS SHALL BE BORED THROUGH FILLER BLOCK AND SHALL BE BORED IN WOOD LINING BELOW FROST BOARD. THE LOCATION AND SIZE OF HOLES SHALL BE DETERMINED IN THE FIELD.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

SMALL CONCRETE BATTERY BOX.

SCALE: 1" = 1'-0". ALBANY, MARCH 14, 1917.

W. H. Elliott 3/15/17.

SIGNAL ENGINEER.

RECD
APR
1917

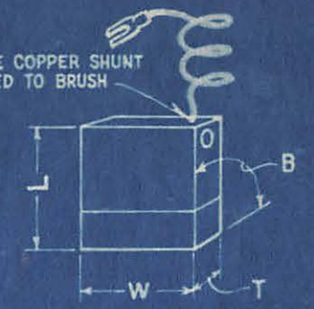
TYPE OF MOTOR		DIMENSIONS A	C	L	W	T	STYLE	MATERIAL	ANGLE B	CHARACTERISTICS: SPECIFIC RESISTANCE OHMS PER INCH CUBE	HARDNESS SCLEROSCOPE	CARRYING CAPACITY AMP. PER SQ. INCH	TRANSVERSE STRENGTH LBS. PER SQ. INCH	CONTACT DROP POS.+NEG. FULL CAPACITY 4 LB. PRESSURE VOLTS	ORDER NOS
GENERAL RY. SIG. CO.	2A 10 V. D.C. SIGNAL			1 1/4"	3/4"	1/4"	2	METAL GRAPHITE	90°	.000032	30	100	2500	0.50	X-17001
	" " "			3/4"	3/4"	1/4"	3	"	"	"	"	"	"	"	X-17002
	" 110 V. D.C. "			1 1/2"	3/4"	1/4"	3	"	"	"	"	"	"	"	X-17003
	MODEL 2 SWITCH			2"	1 7/32"	3/8"	3	"	"	"	"	"	"	"	X-17004
	" 4 "			2 1/4"	3/4"	1/2"	3	"	"	"	"	"	"	"	X-17005
UNION SW. & SIG. CO.	STYLE B 10 V. D.C. SIG.	5/16"	5/32"	1"	17/64"	7/64"	6	COPPER	40°						X-17007
	" S & B 110 V. D.C. SIG.			3/4"	3/4"	5/16"	3	ABRASIVE CARBON	90°	.0012	50	35	3700	1.90	X-17008
	" S & B 110 V. D.C. SIG. INDICATION.			3/4"	1/2"	3/16"	3	"	"	"	"	"	"	"	X-17009
	" B 110 V. D.C. SWITCH			1 1/2"	1 1/8"	1/4"	3	"	"	"	"	"	"	"	X-170010
	" B 110 V. D.C. SWITCH CLUTCH.			1 3/8"	3/8"	3/4"	3	GRAPHITE	2 3/4" RAD.	.00042	22	55	3000	1.55	X-170011
HALL SW. & SIG. CO.	* STYLE H & K 10 V. D.C. SIG.			5/8"	13/32"	3/16"	5	METAL GRAPHITE	90°	.000012	25	125	4300	0.35	X-170013
	" L " "			11/16"	1/2"	7/32"	4	"	"	"	"	"	"	"	X-170014
	LOW VOLT. SWITCH			11/16"	1/2"	7/32"	4	"	"	"	"	"	"	"	"
	STYLE F 10 V. D.C. SIG.	9/32"	7/64"	7/8"	17/64"	7/64"	6	COPPER	60°						X-170016
FEDERAL SIG. CO.	MODEL 2 & 4 110 V. D.C. SWITCH			1 1/4"	1 1/4"	3/8"	1	CARBON	90°	.0014	52	40	5000	1.08	X-170018
	TYPE 41 110 V. D.C. SIG.			1 5/16"	3/4"	5/16"	2	ABRASIVE CARBON	"	.0012	50	35	3700	1.90	X-170019
	UNIVERSAL " "			1 1/16"	7/16"	5/16"	3	"	"	"	"	"	"	"	X-170020
	SPECIAL 110 V. D.C. DWARF			1"	5/16"	3/8"	3	"	80°	"	"	"	"	"	X-170021

* USE BRUSH X-170013 FOR STYLE K 110 V. D.C. SIGNAL.

NOTE.- SIGNAL MOTOR BRUSHES OF SPECIAL SHAPE, NOT SHOWN ABOVE, SHALL BE ORDERED BY REFERENCE TO THE MANUFACTURER AND THE TYPE OF SIGNAL IN WHICH THEY ARE USED.

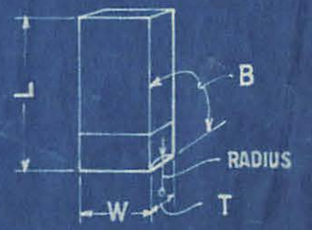
X-170 REV. 1

1-24-18

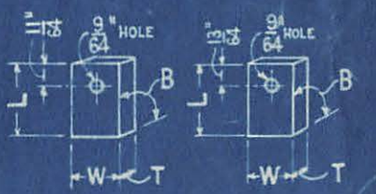


STYLE 1 - PLAIN CONNECTION

STYLE 2 - BEADED "



STYLE 3



STYLE 4 STYLE 5 STYLE 6

N.Y.G.R.R.

SIGNAL DEPT.

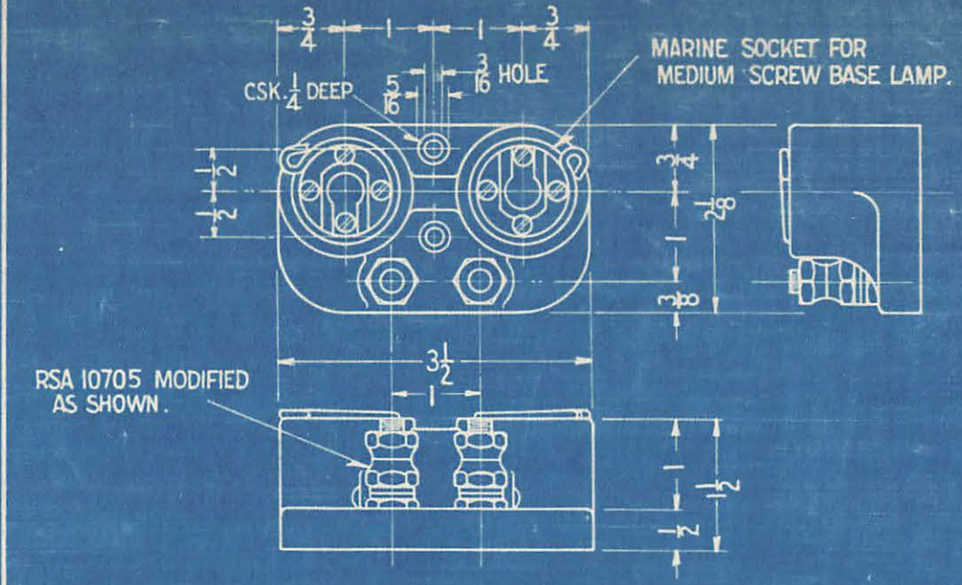
MOTOR BRUSHES SWITCHES & SIGNALS.

ALBANY, NOV. 19-1917.

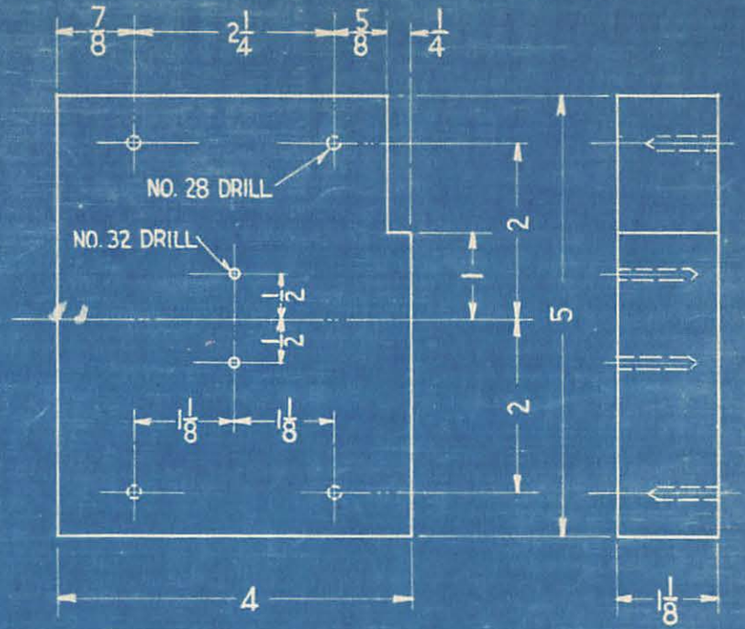
W. H. Elliott "1/9/17

SIGNAL ENGINEER.

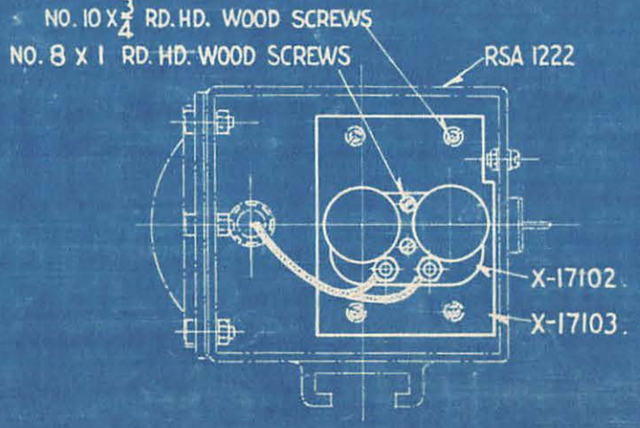
X-171



X-17102 LAMP BASE
GLAZED PORCELAIN.



X-17103 BASE BLOCK
HARD MAPLE FINISHED AND GIVEN TWO COATS SPAR VARNISH.

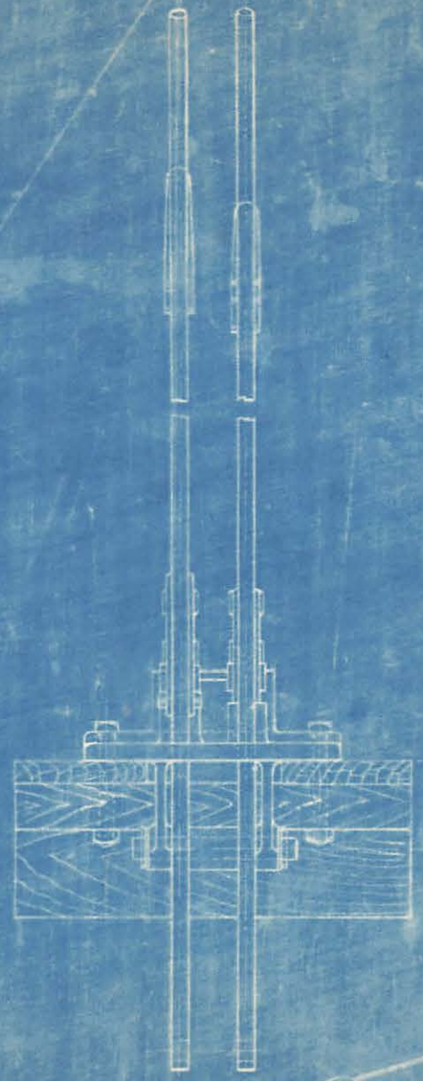


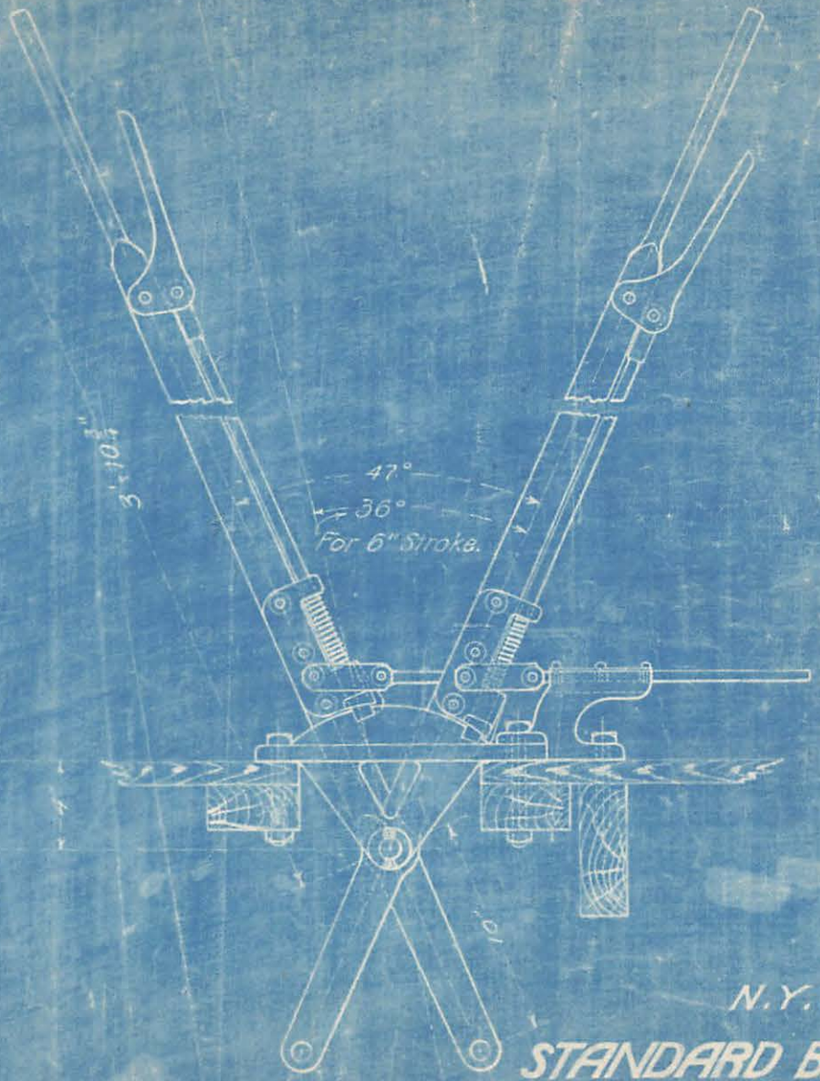
X-17101 ASSEMBLY OF LAMP BASE AND BLOCK.

SCALE AND ALL DIMENSIONS ARE GIVEN IN INCHES

N. Y. C. R. R.
SIGNAL DEPARTMENT
LAMP BASE AND BLOCK
ALBANY, MAY 3 - 1922

W. H. Elliott 5/11/22.
SIGNAL ENGINEER.





Y-1

-Note-
6" Stroke to be used on the
when specified.

N.Y.C. & H.R.R.R.

STANDARD BLOCK LEVER STAND

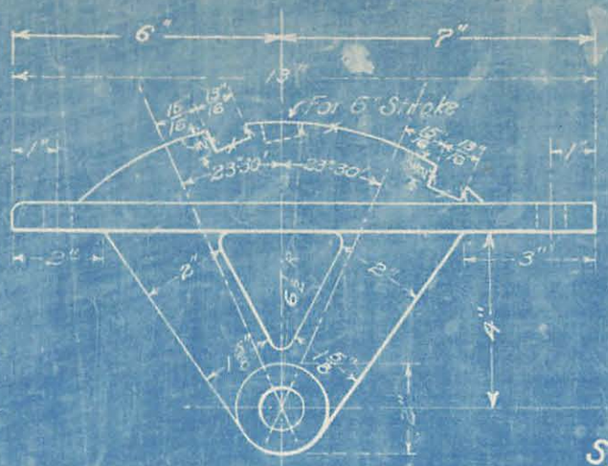
A. S. Harlow
Engineer Maintenance of Way

W. H. Elliott
Engineer of Signals

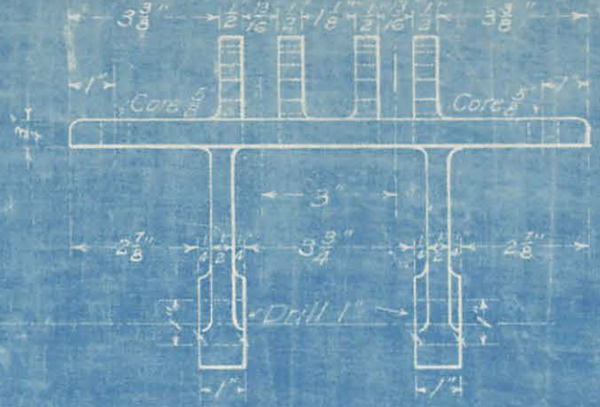
J. D. Brady
General Superintendent

Scale 1½" = 1' J.J.H. 3-7-04.

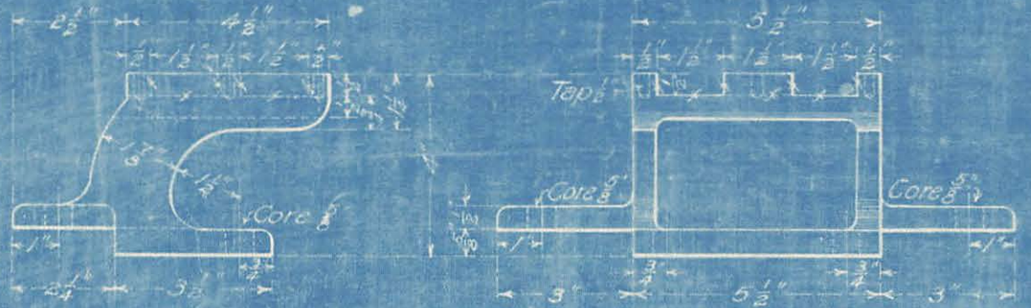
Y-2
REK 3



STAND.



TOP PLATE.
FIN. ALL OVER.



LOCKING BRACKET.

TAPPET.
FIN. ALL OVER

DOG.
FIN. ALL OVER.

LINK.
FIN. ALL OVER.

PIN.
FIN. ALL OVER.

N.Y.C. & H.R.R.R.

STANDARD BLOCK LEVER STAND DETAILS

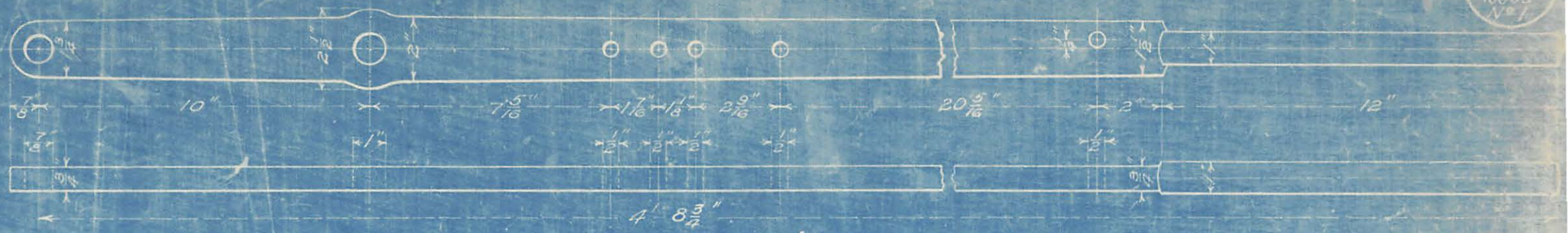
Scale 3"-1' J.J.H. 3-9-04.

A. Hardin
Engineer Maintenance of Way.

W.H. Elliott
Engineer of Signals

J. Bradfield
General Superintendent.

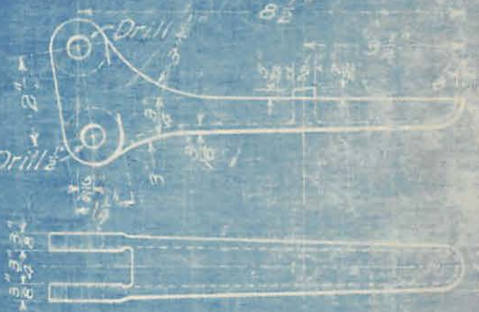
Y-3
Issue No. 1



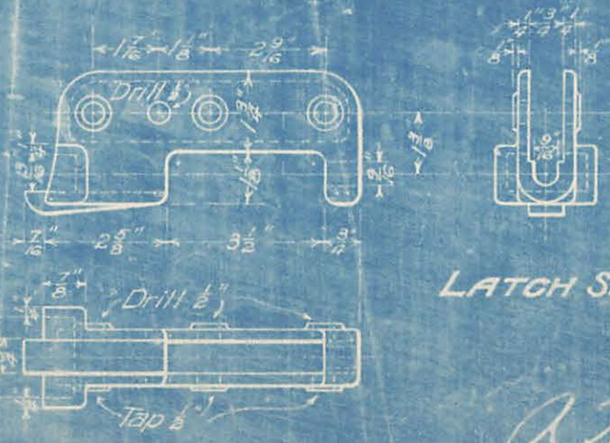
LEVER.

LATCH ROD.

THIMBLE.



LATCH HANDLE.



LATCH SHOE.

SPRING.
No 7 B.&S. Spring Wire,
Round on 1/2" Arbor.

TAP BOLT.

PIN.

N.Y.C. & H.R.R.R.

STANDARD BLOCK LEVER STAND DETAILS

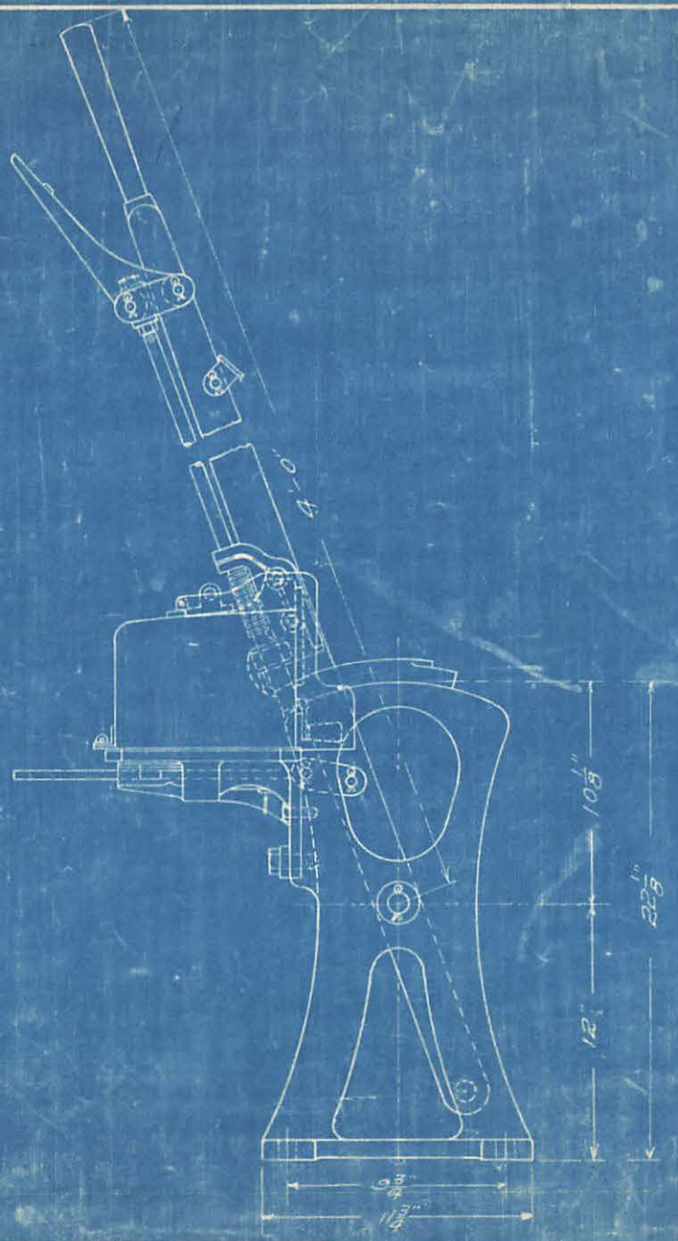
A. S. Hardin
Engineer Maintenance of Way.

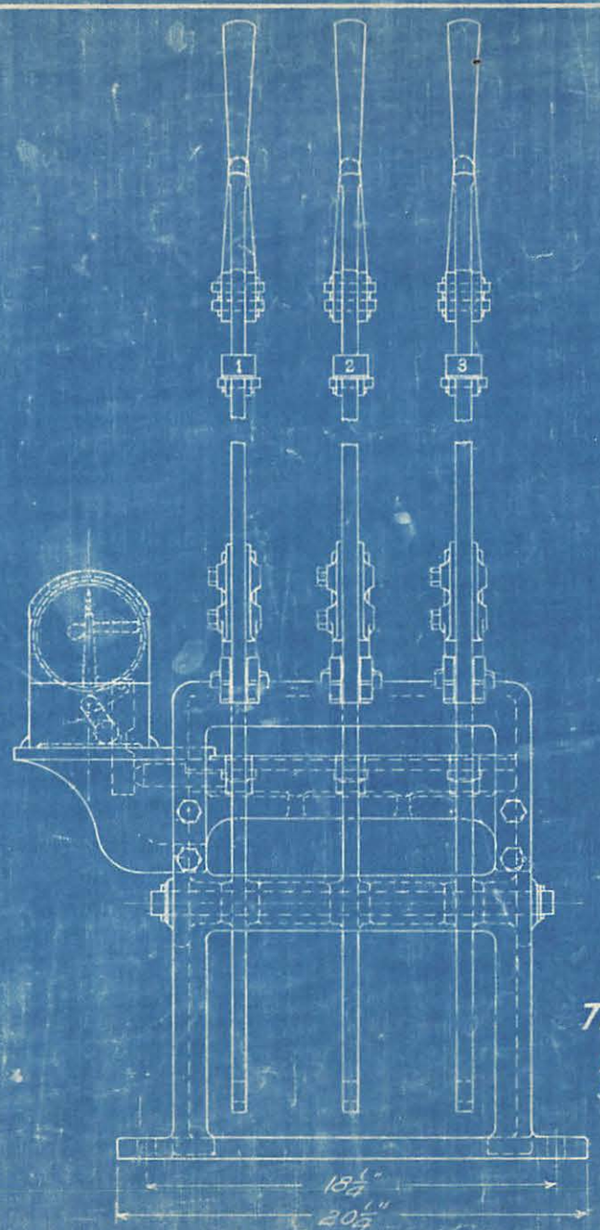
W. H. Elliott
Engineer of Signals.

J. T. Gaspard
General Superintendent.

Scale 3"-1' J.J.H. 4-6-04.

Y-13
N° 1





N. Y. C. & H. R. R. R.

SIGNAL DEPARTMENT EXTERIOR ZONE

THREE-LEVER DWARF INT. MACH. WITH ELEC. LOCK & INDICATOR

SCALE 1/2" = 1'-0" NEW YORK MAR. 13 - 1908 - O.R.

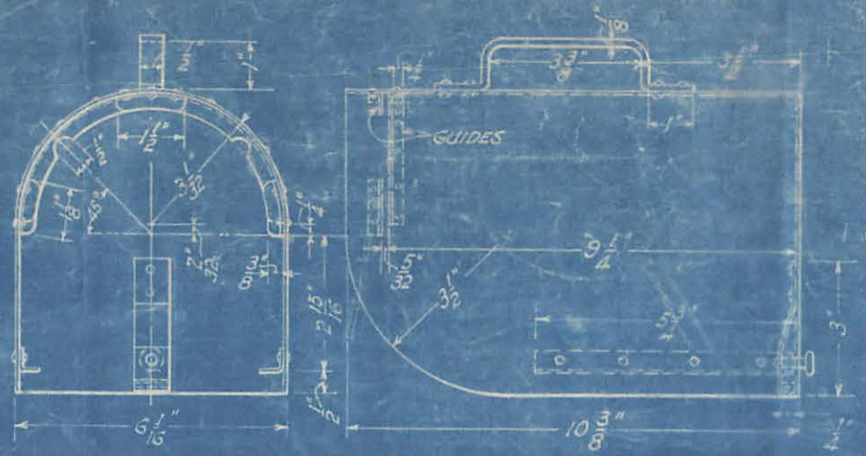
W. H. Elliott 3/14/08

SIGNAL ENGINEER

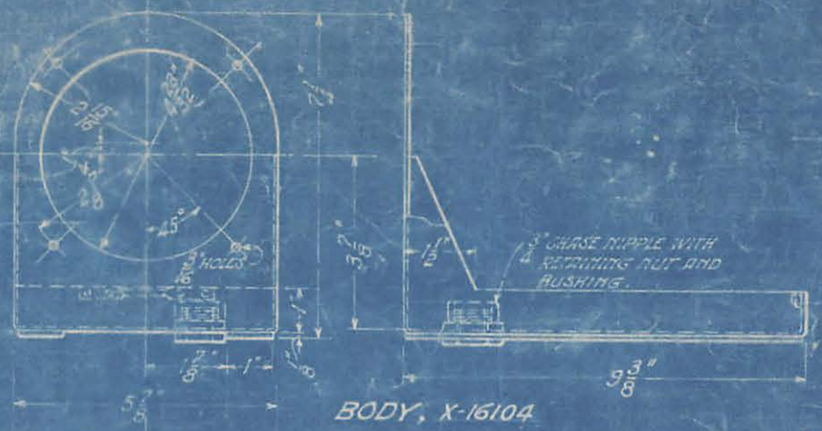
3-29-18.

X-161
REL. 5

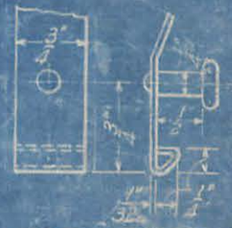
SHEET 2.



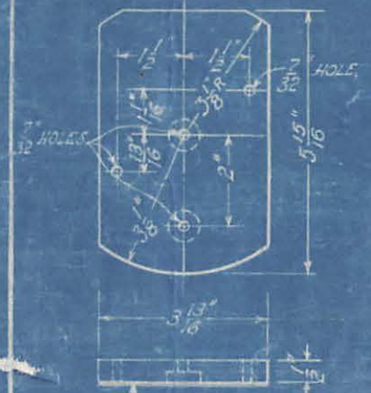
COVER, X-16106.



BODY, X-16104

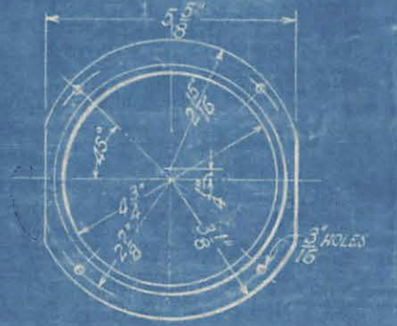


DETAIL OF LATCH.



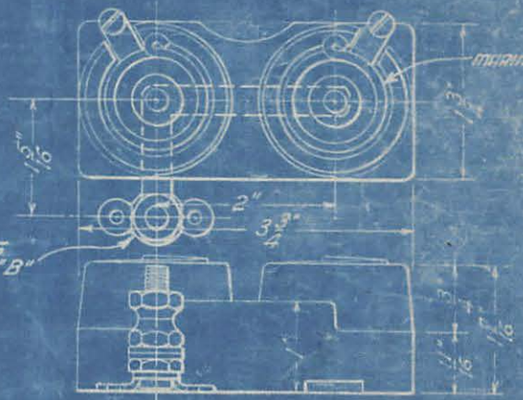
BASE BLOCK, X-16101
MAPLE.

OIL CAMBRIC TO BE GLUED TO BOTTOM OF BASE BLOCK AFTER LAMP BASE HAS BEEN FASTENED.

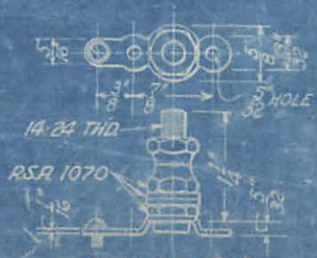


LENS RING, X-16105

BOLT HOLES TO BE DRILLED ON GROUND AFTER LAMP IS ADJUSTED IN PLACE.



LAMP BASE, X-16107.
(GLAZED PORCELAIN).
SCALE: HALF SIZE.



BINDING POST "A"
HALF SIZE

NOTE: COVER AND BODY, EXCEPTING GUIDES, TO BE MADE OF 1/16 U.S.S.D. GAUGE GALV. IRON. GUIDES AND LENS RING TO BE MADE OF 18 U.S.S.D. GAUGE GALV. IRON.

N. Y. C. R. R.

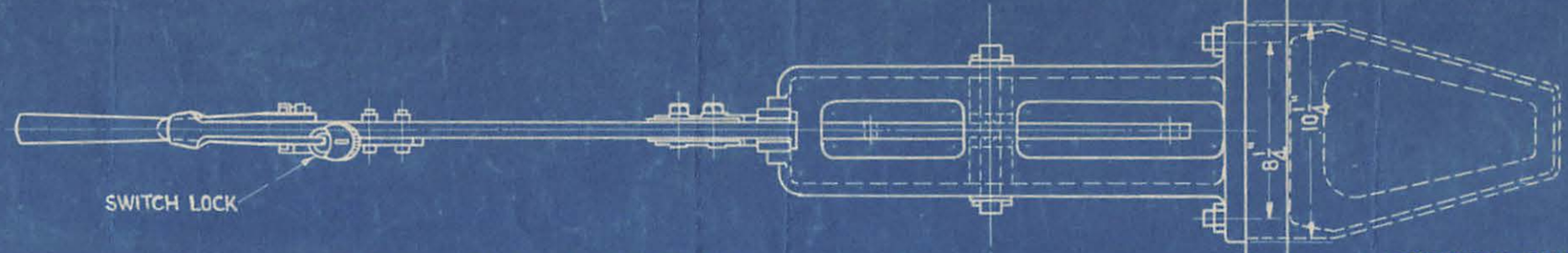
SIGNAL DEPARTMENT.

ELECTRIC SIGNAL LAMP DETAILS.

SCALE: 3"=1'-0". ALBANY, MARCH 23 1915.

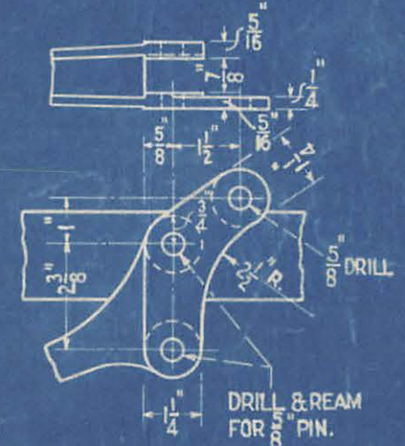
W. H. Elliott. 4/24/15

Y-14
REV. 3
1-24-30

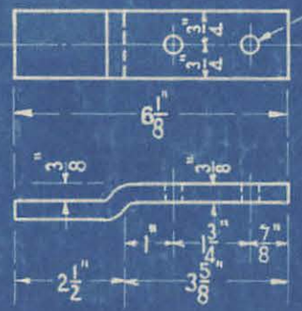


STOP SHALL BE LOCATED SO THAT LATCH CANNOT BE MOVED WHEN PADLOCK IS INSERTED.

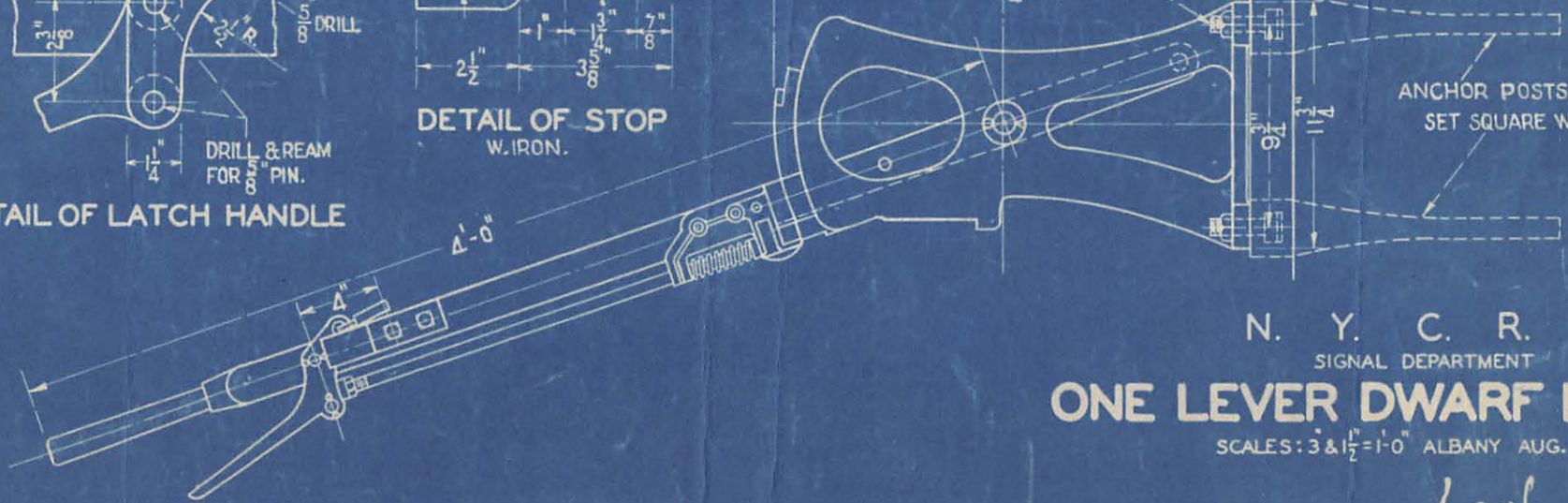
CONCRETE FOUNDATION 11033 PLAN V-5, EXCEPT ANCHOR POST SPACING SHALL BE AS SHOWN.



DETAIL OF LATCH HANDLE



DETAIL OF STOP
W. IRON.



N. Y. C. R. R.

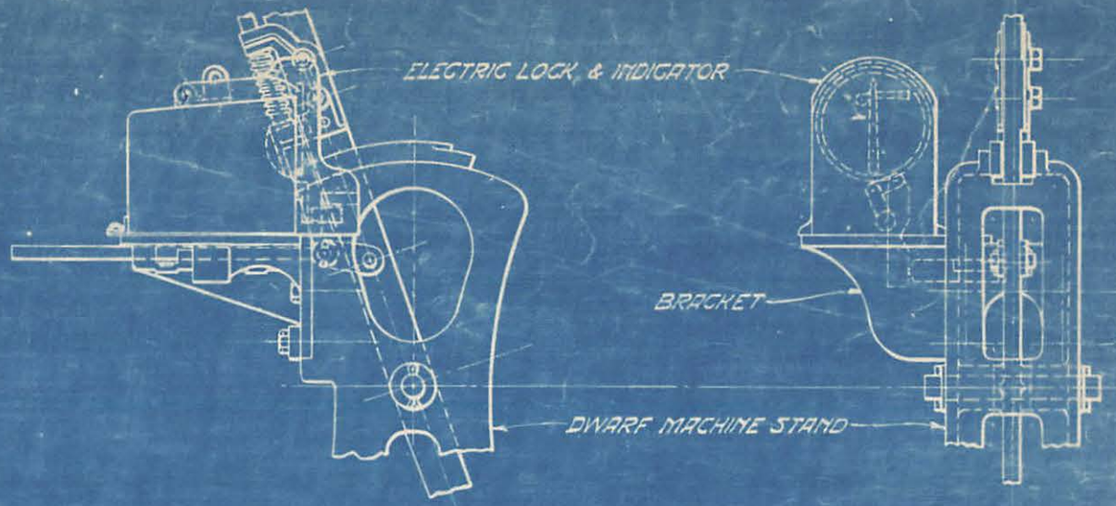
SIGNAL DEPARTMENT

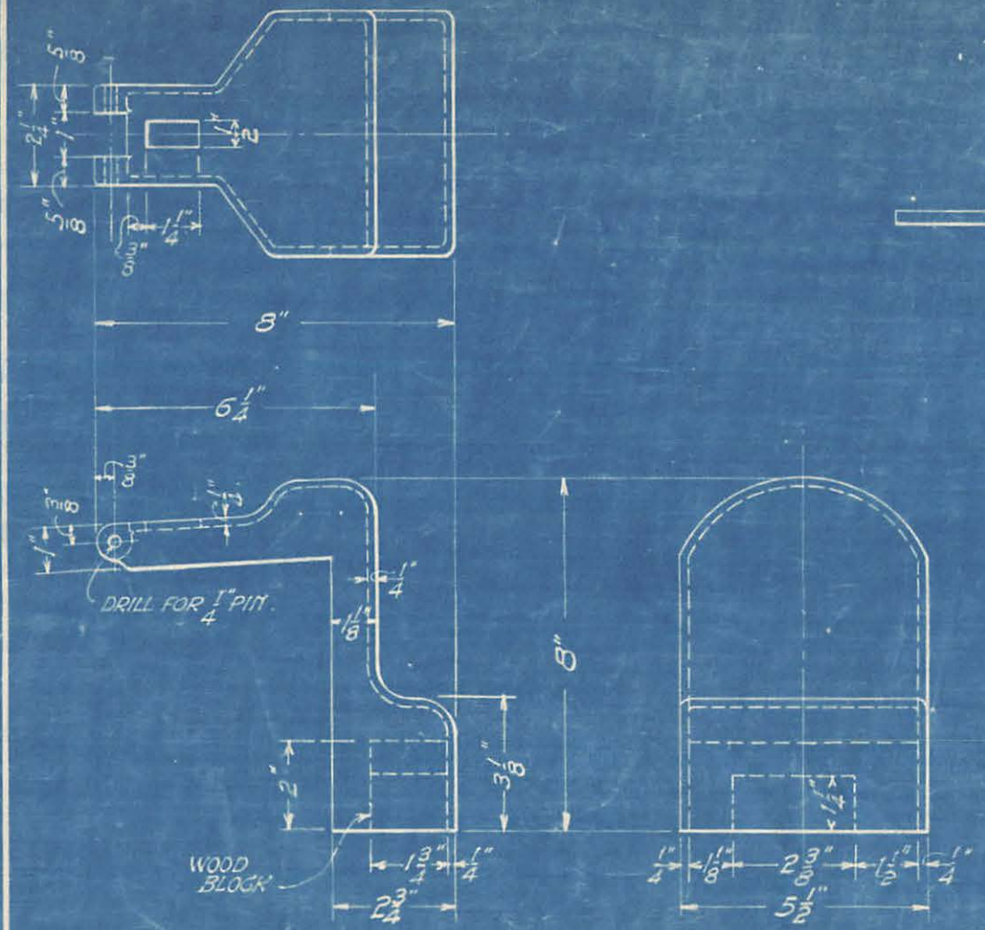
ONE LEVER DWARF MACHINE

SCALES: 3 & 1½" = 1'-0" ALBANY AUG. 14, 1912.

W. H. Elliott 7/31/30

Y-16





INDICATOR SHIELD

N. Y. C. & H. R. R. R.

SIGNAL DEPARTMENT

APPLICATION OF ELECTRIC LOCK & INDICATOR TO DWARF MACHINE

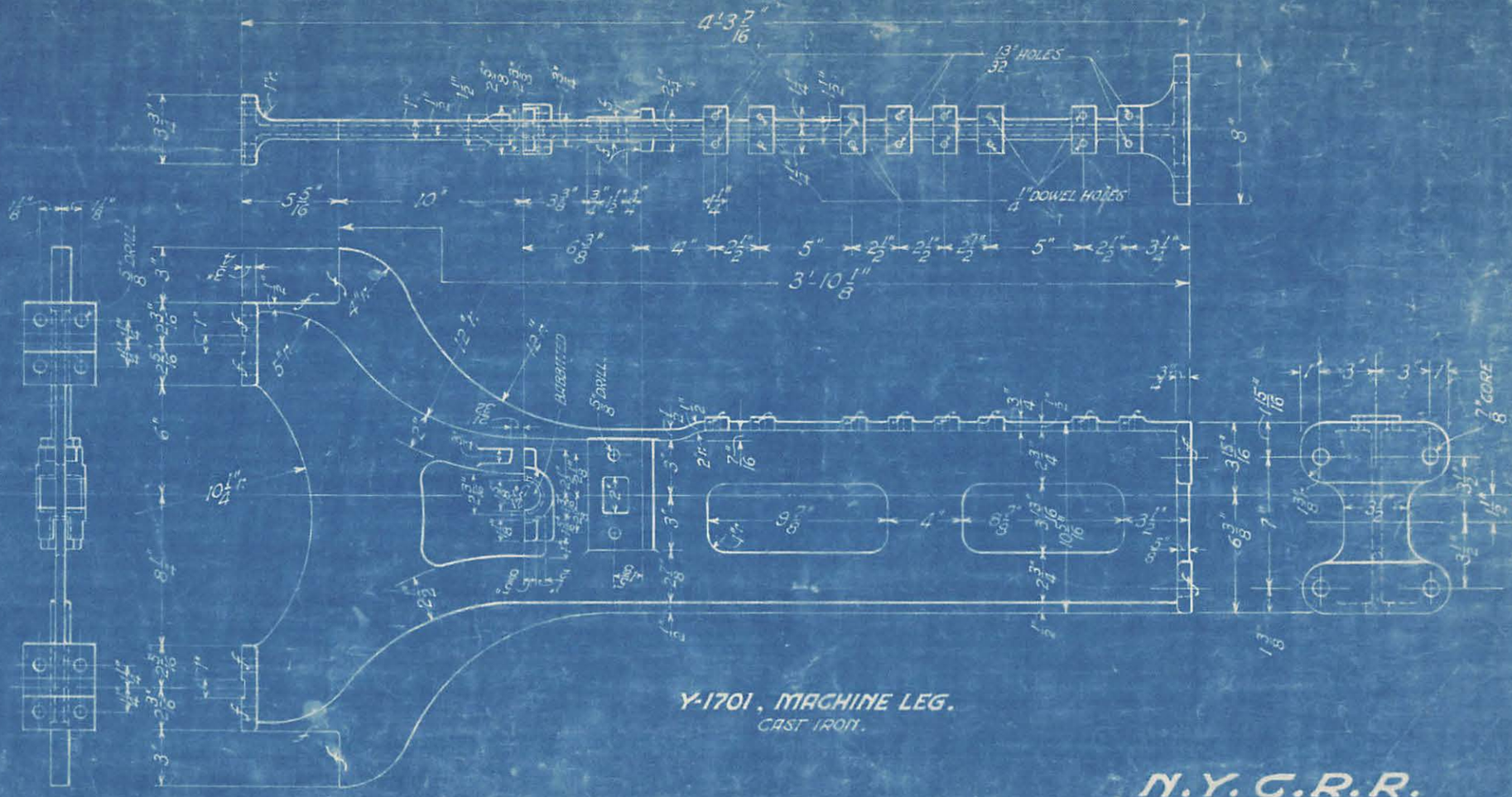
SCALES 1 1/2" & 3" = 1'-0" ALBANY AUG. 27, 1912.

W. H. Elliott 9/30/12.

SIGNAL ENG'R.

Y-17
REV. 2

1-15-20



Y-1701, MACHINE LEG.
CAST IRON.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

STYLE "A" MACHINE LEG.

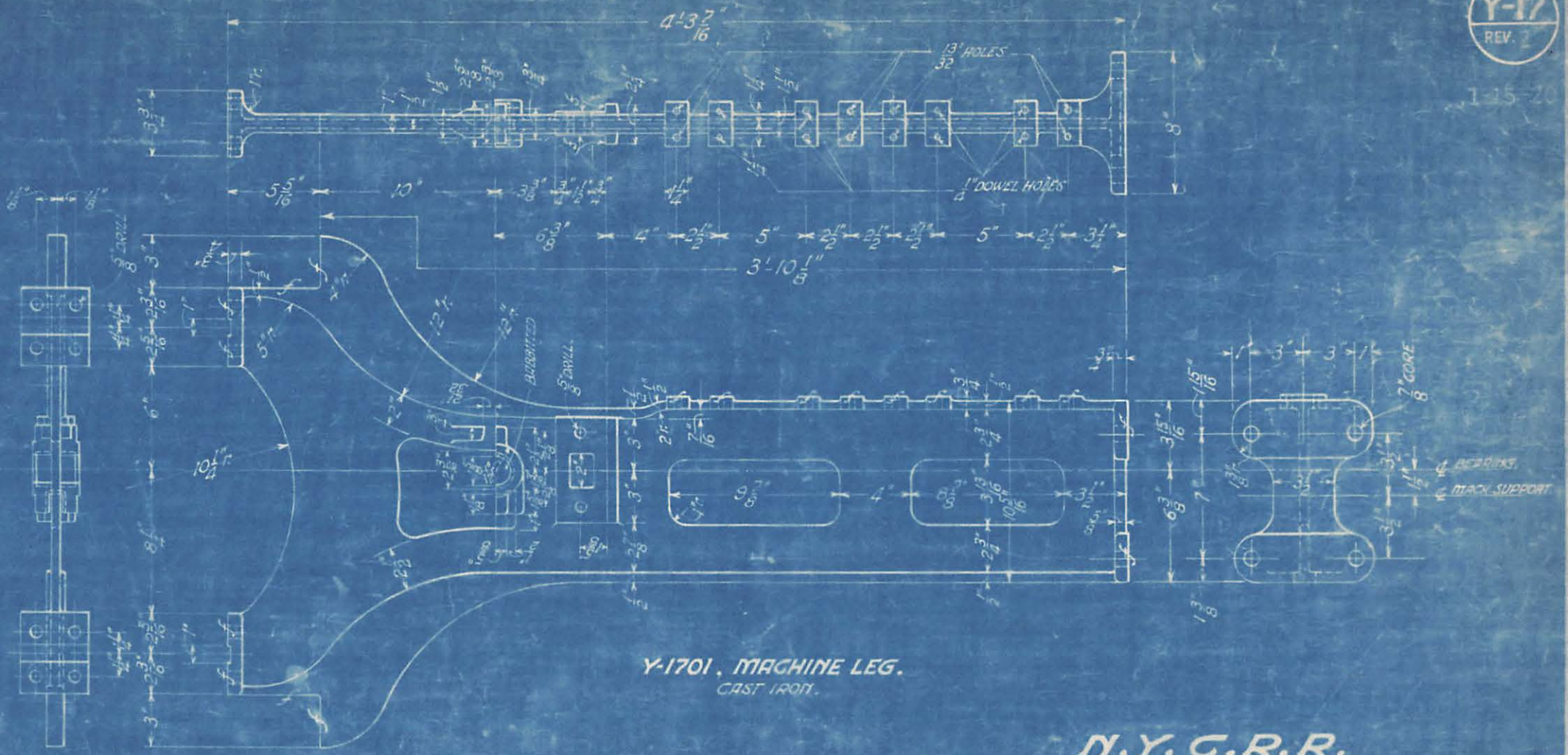
SCALE: 1½" = 1'-0". ALBANY, SEPT 17TH 1914.

W. H. Elliott. 10/1/14

SIGNAL ENGINEER.

Y-17
REV.

1-15-20



Y-1701, MACHINE LEG.
CAST IRON.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

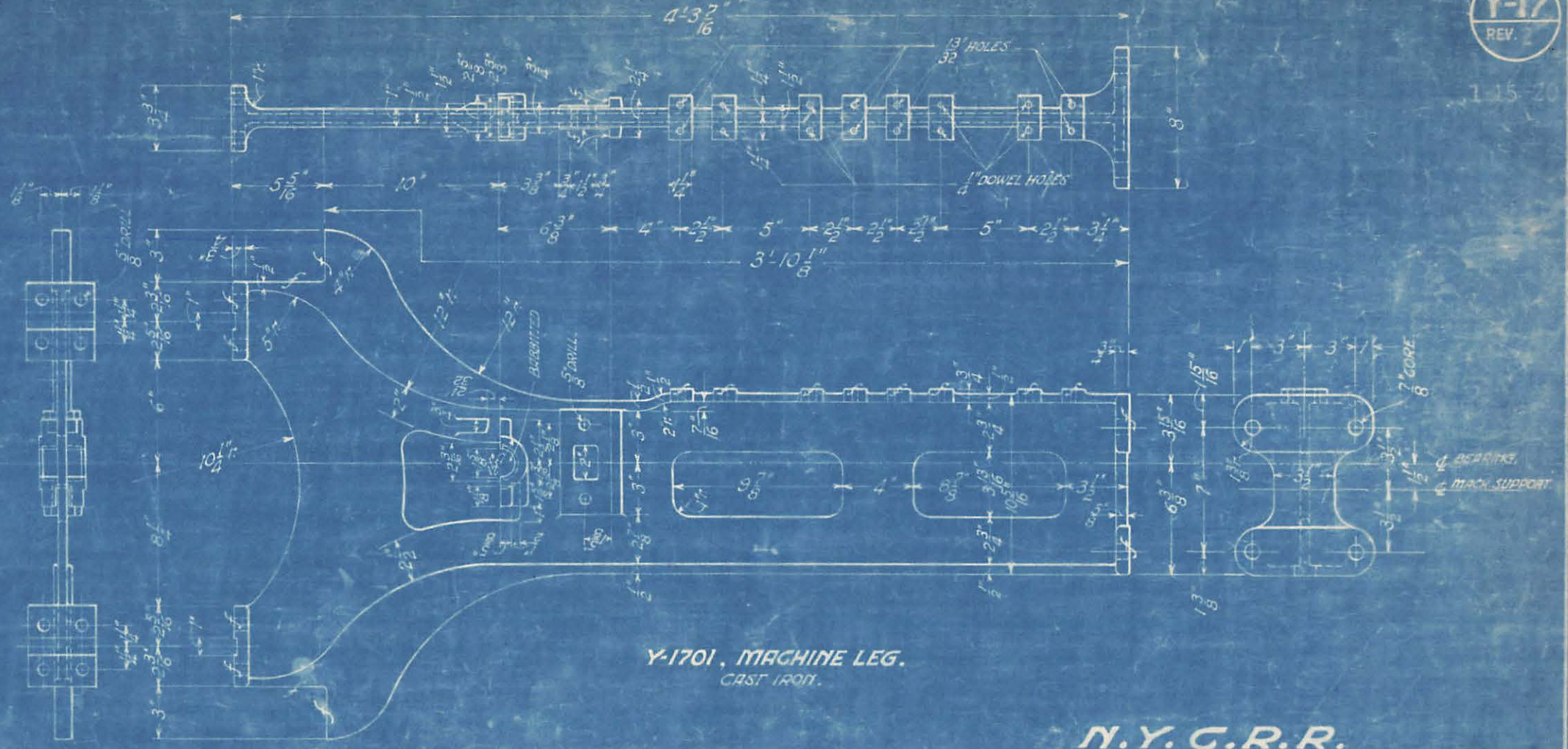
STYLE "A" MACHINE LEG.

SCALE 1½" = 1'-0". ALBANY, SEPT. 17th 1914.

W.H. Elliott. 10/1/14
SIGNAL ENGINEER.

Y-17
REV.

1-15-20



Y-1701, MACHINE LEG.
CAST IRON.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

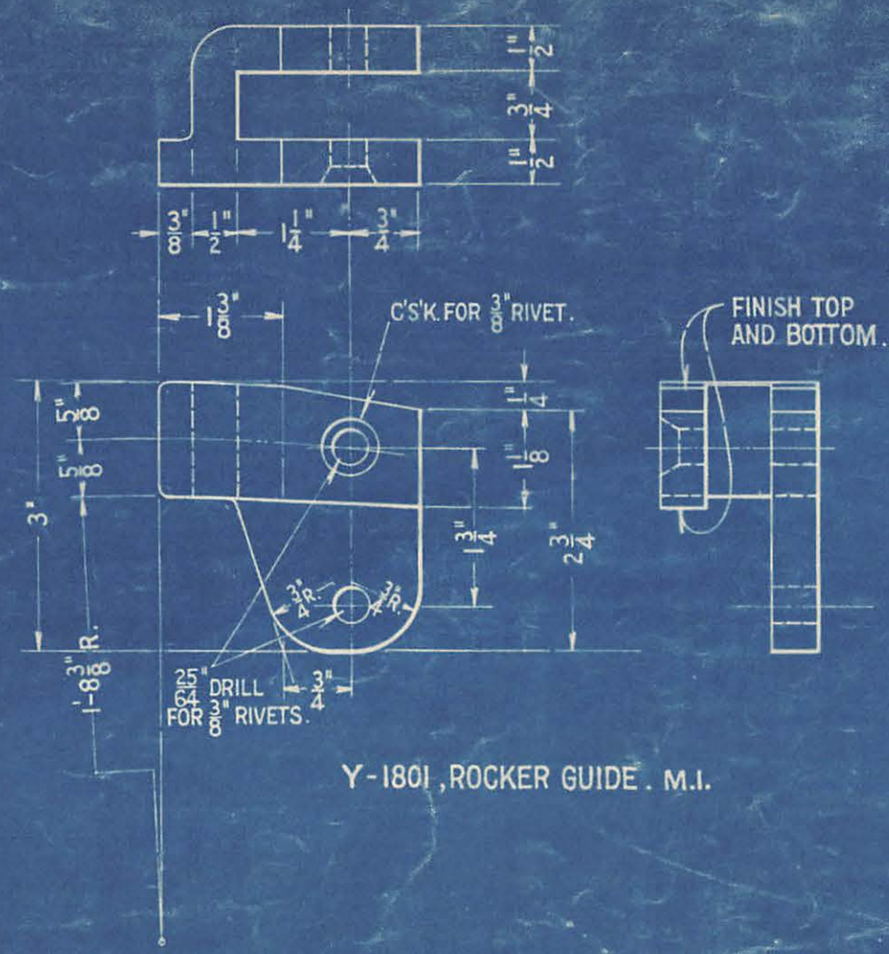
STYLE "A" MACHINE LEG.

SCALE: 1½" = 1'-0". ALBANY, SEPT. 17th 1914.

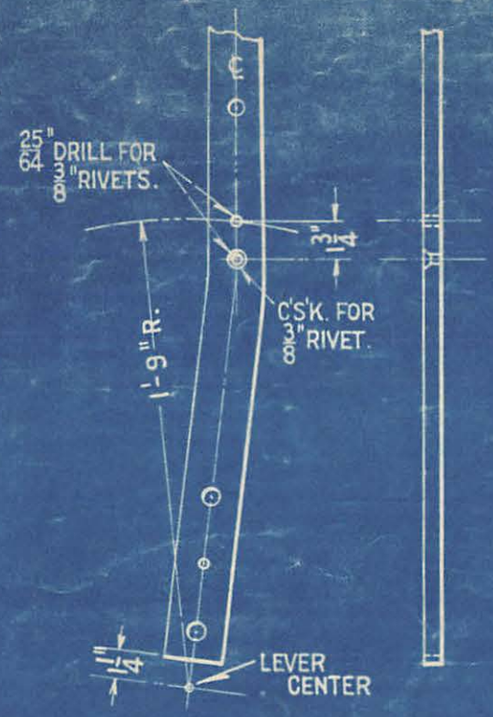
W.H. Elliott. 10/1/14
SIGNAL ENGINEER.

Y-18

4-21-19



Y-1801, ROCKER GUIDE. M.I.



LEVER DRILLING

ASSEMBLY.

N.Y.C.R.R.

SIGNAL DEPARTMENT

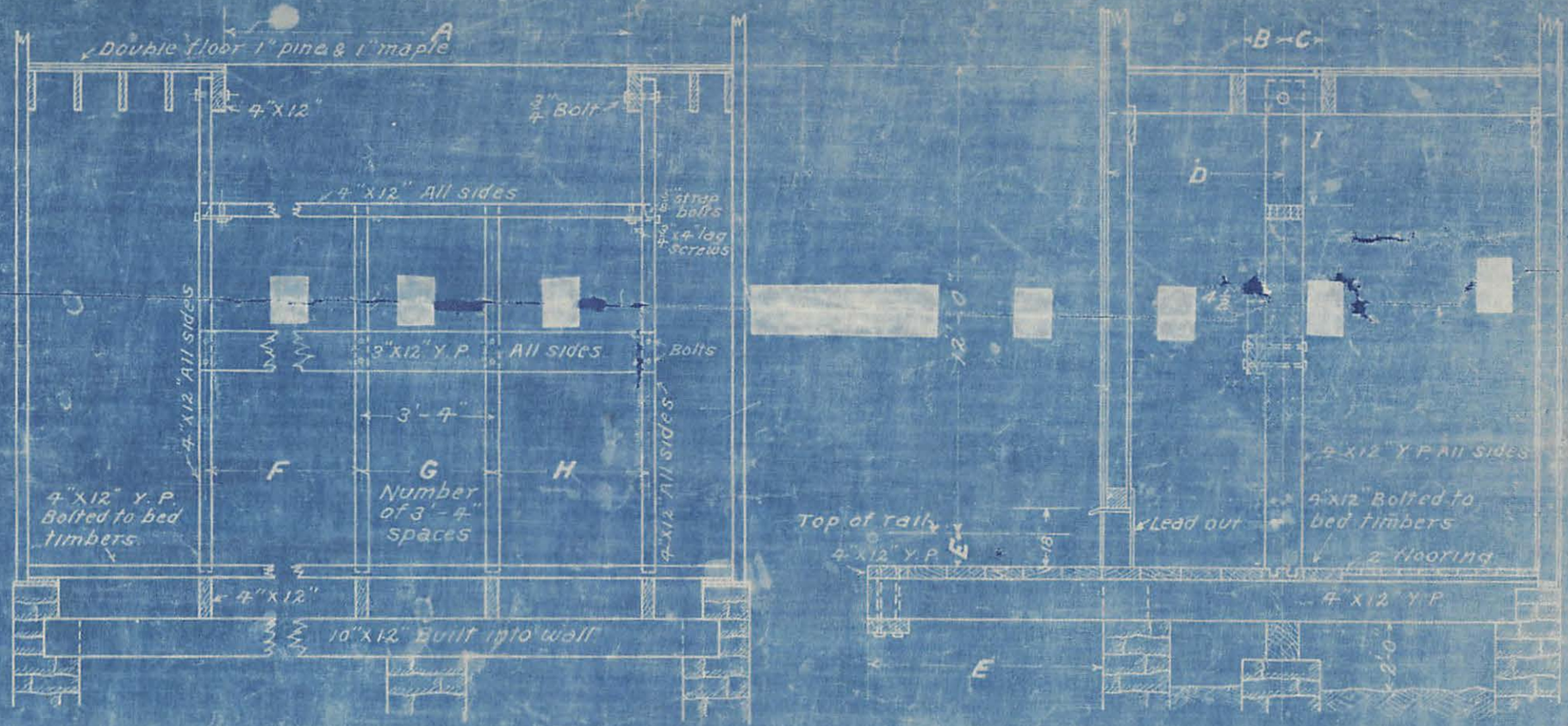
ROCKER GUIDE STYLE "A" MACHINE.

SCALES: 6"=1'-0" & 1 1/2"=1'-0". ALBANY, APRIL 21st, 1919.

W.H. Elliott. 4/24/19.

SIGNAL ENGINEER.

Z-8



NOTE: FOR TABLE OF DIMENSIONS SEE PLAN Z-9.

N.Y.C. & H.R.R.R.

STANDARD MACHINE FRAMING

W.H. Elliott
Engineer of Signals.

J.P. Burkett
Gen'l. Supt.

H.O. 5-16-04. Scale 1/2" = 1ft.

Z-9
REV. 3

S. & F. MACHINE.

Size of Machine in Levers	A	B	C	D	E	F	G = No. of 3'-4" Spaces	H	I
4	2'-0"	1'-10"	10"	4'-6"	This dimension to be given for each interlocking.	4'-0"	0	4'-0"	2'-9"
8	3'-8"	1'-10"	10"	4'-6"		4'-0"	0	4'-0"	2'-9"
12	5'-4"	1'-10"	10"	4'-6"		4'-0"	0	4'-0"	2'-9"
16	7'-0"	1'-10"	10"	4'-6"		4'-0"	0	4'-0"	2'-9"
20	8'-8"	1'-10"	10"	4'-6"		2'-4"	1	4'-0"	2'-9"
24	10'-4"	1'-10"	10"	4'-6"		4'-0"	1	4'-0"	2'-9"
[illegible]	12'-0"	1'-10"	10"	5'-0"		2'-4"	2	4'-0"	2'-9"
[illegible]	13'-8"	1'-10"	10"	5'-6"		4'-0"	2	4'-0"	2'-9"
36	15'-4"	1'-10"	10"	5'-6"		2'-4"	3	4'-0"	2'-9"
40	17'-0"	1'-10"	10"	5'-6"		4'-0"	3	4'-0"	2'-9"
44	18'-8"	1'-10"	10"	6'-0"		2'-4"	4	4'-0"	2'-9"
48	20'-4"	1'-10"	10"	6'-0"		4'-0"	4	4'-0"	2'-9"
52	22'-0"	1'-10"	10"	6'-0"		2'-4"	5	4'-0"	2'-9"
56	23'-8"	1'-10"	10"	6'-6"		4'-0"	5	4'-0"	2'-9"
60	25'-4"	1'-10"	10"	7'-0"		2'-4"	6	4'-0"	2'-9"
64	27'-0"	1'-10"	10"	7'-0"		4'-0"	6	4'-0"	2'-9"
68	28'-8"	1'-10"	10"	7'-0"		2'-4"	7	4'-0"	2'-9"
72	30'-4"	1'-10"	10"	7'-6"		4'-0"	7	4'-0"	2'-9"
76	32'-0"	1'-10"	10"	7'-6"		2'-4"	8	4'-0"	2'-9"
80	33'-8"	1'-10"	10"	8'-0"		4'-0"	8	4'-0"	2'-9"
84	35'-4"	1'-10"	[illegible]	8'-0"		2'-4"	9	4'-0"	2'-9"
88	37'-0"	1'-10"	[illegible]	[illegible]'-6"		4'-0"	9	4'-0"	2'-9"
92	38'-8"	1'-10"	[illegible]	[illegible]'-6"		2'-4"	10	4'-0"	2'-9"
96	40'-4"	1'-10"	[illegible]	[illegible]'-6"		4'-0"	10	4'-0"	2'-9"
100	42'-0"	1'-10"	[illegible]	[illegible]'-6"		2'-4"	11	4'-0"	2'-9"

STYLE "A" MACHINE.

Size of Machine in Levers	A	B	C	D	E	F	G = No. of 3'-4" Spaces	H	I		
									1 Lock Pl.	2 Lock Pl.	3 Lock Pl.
4	2'-0"	11½"	12¼"	4'-6"	This dimension to be given for each interlocking.	4'-0"	0	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
8	3'-8"	11½"	12¼"	4'-6"		4'-0"	0	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
12	5'-4"	11½"	12¼"	4'-6"		4'-0"	0	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
16	7'-0"	11½"	12¼"	4'-6"		4'-0"	0	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
20	8'-8"	11½"	12¼"	4'-6"		2'-4"	1	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
24	10'-4"	11½"	12¼"	4'-6"		4'-0"	1	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
28	12'-0"	11½"	12¼"	4'-6"		2'-4"	2	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
32	13'-8"	11½"	12¼"	4'-6"		4'-0"	2	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
36	15'-4"	11½"	12¼"	4'-6"		2'-4"	3	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
40	17'-0"	11½"	12¼"	4'-6"		4'-0"	3	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
44	18'-8"	11½"	12¼"	4'-6"		2'-4"	4	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
48	20'-4"	11½"	12¼"	4'-6"		4'-0"	4	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
52	22'-0"	11½"	12¼"	4'-6"		2'-4"	5	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
56	23'-8"	11½"	12¼"	4'-6"		4'-0"	5	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
60	25'-4"	11½"	12¼"	4'-6"		2'-4"	6	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
64	27'-0"	11½"	12¼"	4'-6"		4'-0"	6	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
68	28'-8"	11½"	12¼"	4'-6"		2'-4"	7	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
72	30'-4"	11½"	12¼"	4'-6"		4'-0"	7	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
76	32'-0"	11½"	12¼"	4'-6"		2'-4"	8	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
80	33'-8"	11½"	12¼"	4'-6"		4'-0"	8	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
84	35'-4"	11½"	12¼"	4'-6"		2'-4"	9	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
88	37'-0"	11½"	12¼"	4'-6"		4'-0"	9	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
92	38'-8"	11½"	12¼"	4'-6"		2'-4"	10	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
96	40'-4"	11½"	12¼"	4'-6"		4'-0"	10	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"
100	42'-0"	11½"	12¼"	4'-6"		2'-4"	11	4'-0"	3'-6⅜"	4'-9⅛"	5'-9⅞"

NOTE : FOR DIAGRAM OF SIG. STA. SHOWING REF. LETTERS SEE PLAN Z-8.

N.Y.C. & H.R.R.R.

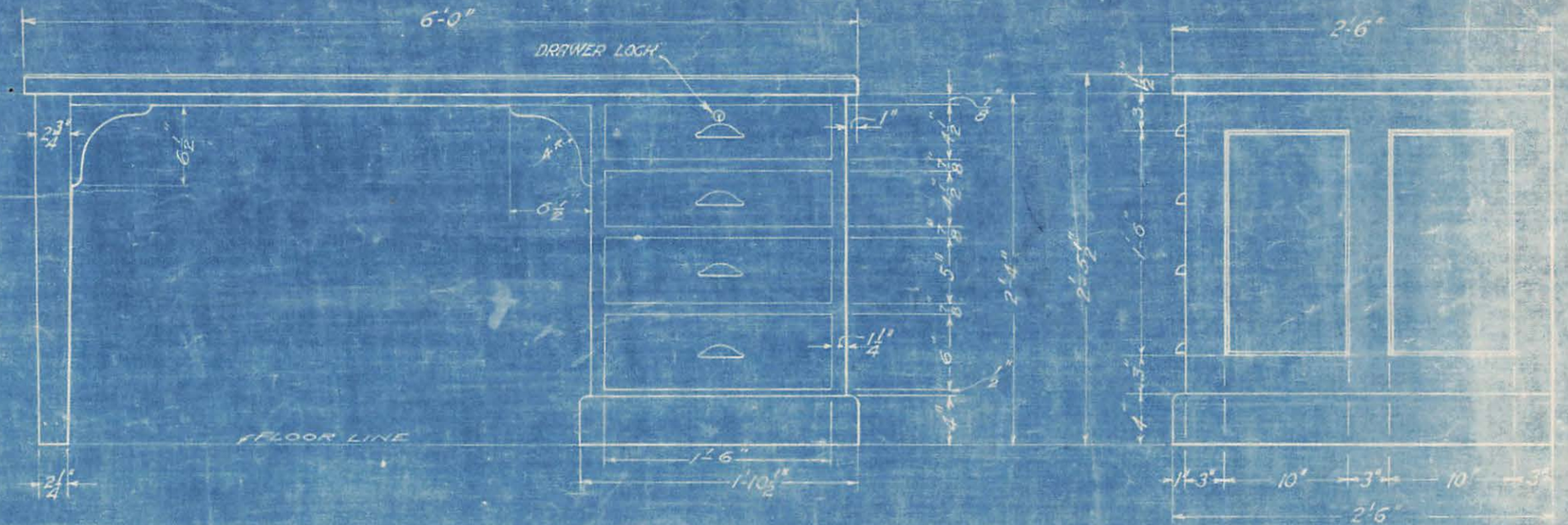
SIGNAL DEPT. - EXTERIOR ZONE

STANDARD MACHINE FRAMING.

TABLE OF DIMENSIONS.

W. H. Elliott. 7/20/09.

SIGNAL ENGINEER.



MATERIAL : DESK SHALL BE OF PINE, EXCEPTING TOP, WHICH SHALL BE OF OAK.
FINISH : WOOD SHALL BE FILLED, STAINED AND VARNISHED.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

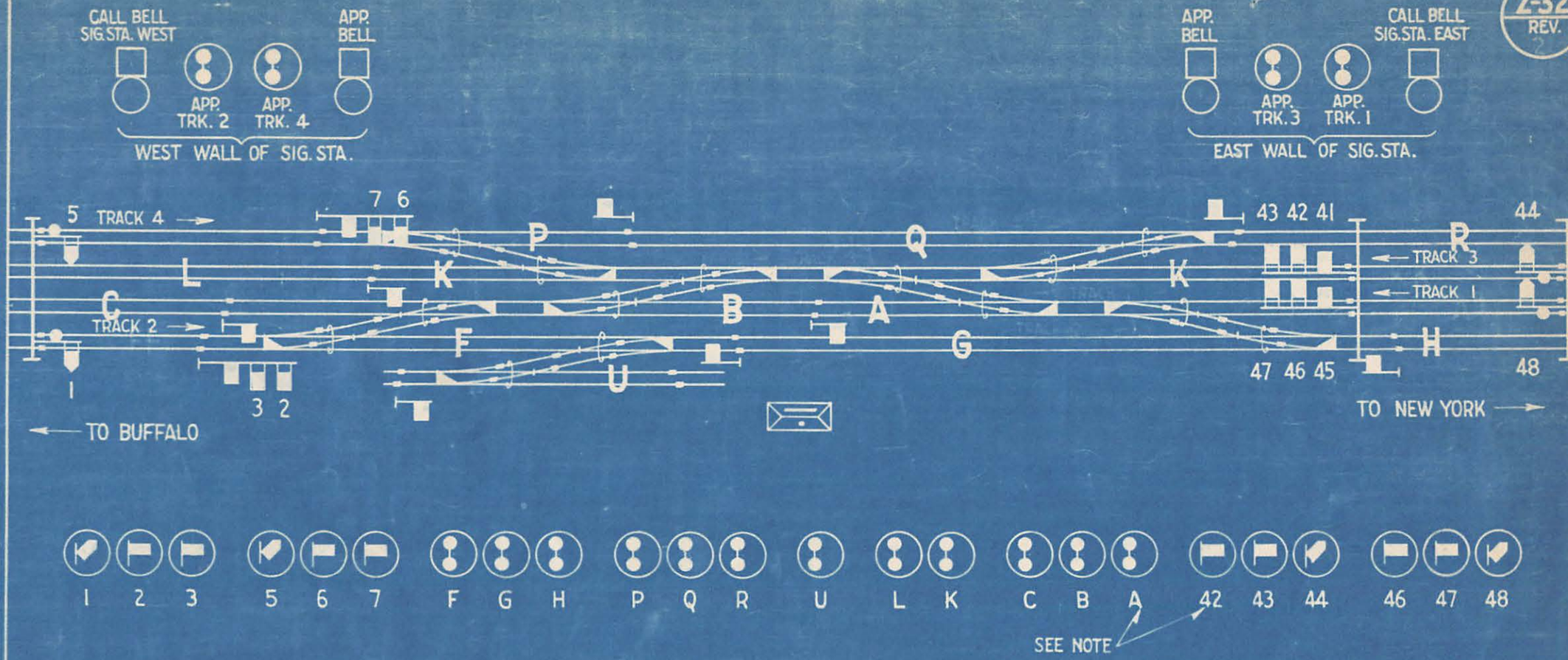
DESK FOR SIGNAL STATIONS

SCALE: 1"=1'-0" - ALBANY, FEB. 12 TH 1919.

W. H. Elliott.
SIGNAL ENGINEER.

Z-23
REV. 2
2-12-19

Z-32
REV.



NOTE: LETTERS AND NUMBERS SHALL BE LOCATED IN ACCORDANCE WITH PLAN X-164.
INDICATORS SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION Z-42.
BELL COVERS SHALL BE PAINTED BLACK.
NUMBER OF ADJACENT SIGNAL STATION EAST OR WEST SHALL BE STENCILED ON CALL BELLS.

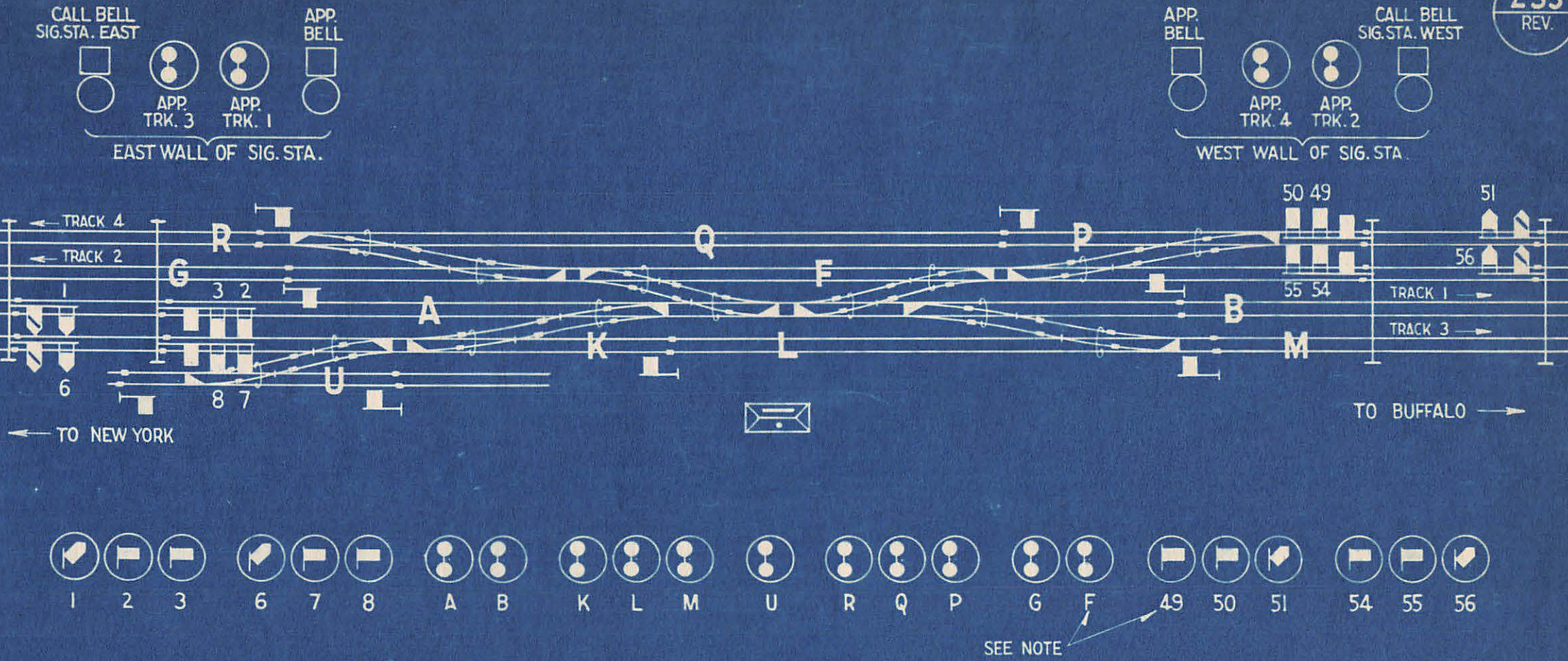
N. Y. C. R. R.
SIGNAL DEPARTMENT

SIGNAL STATION INDICATORS
TYPICAL ARRANGEMENT - MOH. & SYR. DIVS.

ALBANY, DEC. 18 - 1909.

W. H. Elliott 9/24/21
SIGNAL ENGINEER

Z-33
REV.



NOTE: LETTERS AND NUMBERS SHALL BE LOCATED IN ACCORDANCE WITH PLAN X-164.
INDICATORS SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION Z-42.
BELL COVERS SHALL BE PAINTED BLACK.
NUMBER OF ADJACENT SIGNAL STATION EAST OR WEST SHALL BE STENCILED ON CALL BELLS.

N. Y. C. R. R.
SIGNAL DEPARTMENT

SIGNAL STATION INDICATORS
TYPICAL ARRANGEMENT - HUDSON DIV.

ALBANY, NOV. 27 - 1917.

W H Elliott
SIGNAL ENGINEER.

Z-39
REV.

CONNECTIONS - RAILS TO TRACK RELAY, SHALL BE #8 B. & S. GAUGE RUBBER INSULATED WIRE.
" RAILS TO TRACK BATTERY SHALL BE #10 B. & S. GAUGE RUBBER INSULATED WIRE.
" FOR SHUNTING TRACK THROUGH SWITCH CIRCUIT CONTROLLERS, SHALL BE #6 B. & S. GAUGE RUBBER INSULATED WIRE, ARRANGED IN MULTIPLE.
" FOR CARRYING TRACK CIRCUITS TO FOULING POINTS OF CROSSOVERS AND SIDING SHALL BE #6 B. & S. GAUGE RUBBER INSULATED WIRE ARRANGED IN MULTIPLE.

WIRES BETWEEN BATTERY AND SIGNAL MOTOR SHALL NOT BE SMALLER THAN #6 B. & S. GAUGE, AND WHERE NECESSERY, OF SUCH LARGE SIZE AS TO ENABLE SIGNAL TO BE CLEARED IN THE TIME REQUIRED.

WIRES BETWEEN LINE AND BATTERY IN BATTERY CHARGING CIRCUIT SHALL NOT BE SMALLER THAN #6 B. & S. GAUGE.

RUBBER-COVERED WIRES, UNLESS OTHERWISE SPECIFIED, SHALL BE #12 B. & S. GAUGE.

LINE WIRES SHALL BE #10 B.W.G. DOUBLE BRAIDED WEATHER-PROOF B.B. WIRE FOR NORMAL DANGER LINE CIRCUITS EXCEPT WHERE OTHERWISE SPECIFIED.

LETTER ON TAG DESIGNATING RELAY BINDING POST TO WHICH WIRE IS TO BE ATTACHED IS TO PRECEDE REGULAR WIRE NUMBER AND TO APPEAR ONLY ON THE TAG AT BINDING POST.

RESISTANCE OF RELAYS FOR TRACK CIRCUITS:

CIRCUITS	600 FT. OR LESS IN LENGTH	16	OHMS.
"	601 " TO 1200 FT. " "	12	"
"	1201 " " 1800 " " "	9	"
"	1801 " OR OVER " "	4	"

RESISTANCE OF LINE RELAYS UNLESS OTHERWISE SPECIFIED ON PLANS, SHALL BE 500 OHMS.

RESISTANCE UNITS FOR LINE CIRCUITS, UNLESS OTHERWISE SPECIFIED SHALL BE 100 OHMS.
" " FOR TRACK BATTERY LEADS, UNLESS OTHERWISE SPECIFIED SHALL BE 1 OHM.

SIGNAL MECHANISM SLOT COIL SHALL NOT BE OF GREATER RESISTANCE THAN 500 OHMS.

SWITCH CIRCUIT CONTROLLERS SHALL BE INSTALLED AT SWITCHES IN MAIN TRACK AND MADE TO OPEN LINE CIRCUIT TO SIGNAL AND SHUNT TRACK CIRCUIT WHEN SWITCH IS OPENED. SWITCH CIRCUIT CONTROLLERS SHALL BE PLACED AT DERAIL TO OPEN LINE CIRCUIT TO SIGNAL AND SHUNT TRACK CIRCUIT WHEN DERAIL IS CLOSED, EXCEPT WHERE DERAIL IS CONNECTED TO AND OPERATED BY STAND WORKING MAIN LINE SWITCH, WHEN CIRCUIT CONTROLLER AT DERAIL MAY BE OMITTED.

SWITCH CIRCUIT CONTROLLERS SHALL BE INSTALLED AT INTERLOCKINGS AS CALLED FOR ON CIRCUIT PLAN.

TOWER BATTERY CONNECTIONS SHALL BE AS PER PLAN W-24, UNLESS OTHERWISE SPECIFIED.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

CIRCUIT PLAN SPECIFICATION.

ALBANY, N.Y. JUNE 27, 1912.

Wm. Elec. M. C.

SIGNAL ENGINEER

Z-40
Rev. 2

5-28-18

SIGNAL CRANK AND COMPENSATOR FOUNDATIONS :- Foundations shall be composed of Class "C" and Class "D" concrete and comform to dimensions shown on Drawing V-1 for signal foundations, and Drawing V-5 for crank and compensator foundations.

CLASS "C" CONCRETE.

One (1) part Portland cement,
One (1) part sand, measured loosely,
Two (2) parts broken stone, varying from one sixteenth ($\frac{1}{16}$) inch to three-quarter ($\frac{3}{4}$) inch in largest diameter.

CLASS "D" CONCRETE.

One (1) part Portland cement,
Three (3) parts sand, measured loosely,
Four (4) parts broken stone, in size not to exceed two (2) inches in largest diameter.

PIPE CARRIER FOUNDATIONS :- Pipe carrier foundations shall conform to dimensions shown on Drawing V-2 and be composed of concrete of the following proportions:

One (1) part Portland cement,
Two (2) parts sand or gravel,
Three (3) parts broken stone, three-quarter ($\frac{3}{4}$) inch size.

LADDER FOUNDATIONS :- Foundations shall be as per R.S.A. Plan 1052.

FINISHING :- The outer exposed facing of crank, compensator and signal foundations for a thickness of one (1) inch must be made of one (1) part Portland cement and one and one half ($1\frac{1}{2}$) parts sand deposited simultaneously with the interior mass. The top surface must be floated and rubbed smooth by hand true to grade and line.

ROCK :- Where rock is encountered within the depth required for foundations or post holes, the surface of the rock must be removed sufficiently to secure a solid foundation and anchor bolts of sufficient size to secure firm hold on rock must be placed in holes drilled into the rock to a depth of not less than twelve (12) inches. If the rock is blasted out, the concrete must be let into the rock at least eighteen (18) inches, and as far as possible, the concrete must be larger at the bottom than at the surface of the rock. In each case, the construction provided must be satisfactory to and approved by the Engineer.

BLASTING :- Rock blasting for foundations, post holes etc. must be performed by the Contractor, under the supervision and direction of the Engineer, and in such manner as not to interfere with the safe movement of trains or injury to the track and structures of the Railroad Company or persons and private property that may be in the vicinity.

SETTING :- Signal foundations must be set with top even with bottom of rail.

Crank foundations must be set in accordance with crank locations shown on Drawing V-13.

Compensator foundations must be set in accordance with compensator locations shown on Drawing V-11.

Pipe carrier foundations must be set in accordance with Drawing V-2.

GROUNDS :- Signal foundations shall be provided with copper wire ground in accordance with Drawing X-121.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

FOUNDATION SPECIFICATIONS.

ALBANY, OCT. 11 1912.

W.H. Elliott 10/13/12
SIGNAL ENGINEER.

EXPOSED IRONWORK shall be given a priming coat of formula "E" paint with two (2) succeeding coats of formula "F" paint, except switch lugs, rods, tie plates, rail braces and Hayes derails. Hayes derails shall be given a priming coat of formula "E" paint and two (2) succeeding coats of English Vermillion. Switch rods, lugs, tie plates, and rail braces shall be given two (2) coats of formula "F" paint after being installed.

EXPOSED WOODWORK, trunking and stakes, where above ground, shall be given one (1) coat of formula "P" paint and a finishing coat of formula "F" paint. Trunking and capping shall be painted on the outside surfaces only, one coat being applied before trunking is installed and the second coat after trunking is in place. No paint shall be applied to the inside surfaces of trunking or capping.

INTERIOR WOODWORK installed by the Contractor inside the Signal Station shall be finished the same as the inside of the building.

SIGNAL BLADES shall be painted in accordance with requirements of Drawings 100 and 200.

SIGNAL POLES AND FITTINGS shall be painted as prescribed for exposed iron work.

INTERLOCKING MACHINE including levers, shall be painted one (1) coat of formula "F" paint.

The unfinished parts of the latch handle inside shall be painted the same color as the lever. One (1) coat of varnish shall be applied to all painted parts of machine above operating floor. The finished parts of the machine shall not be painted.

LEVERS of the interlocking machine shall be painted two (2) finishing coats of the following colors:

Block & Interlocking Mechanical Signal	Red,
Block & Interlocking Power Signal	Upper half red, Lower half aluminum,
Distant Mechanical Signal	Yellow,
Distant Power Signal	Upper half yellow, Lower half aluminum,
Switch, M.P. Frog and Switch & Lock	Black,
Low Voltage Switch Machine	Upper half black, Lower half aluminum,
Facing Point Lock	Blue,
Mechanical & Electrical Bolt Lock	Upper half blue, Lower half aluminum,
Check Lock	Green,
Gate	Aluminum,
Spare Lever	White.

10-2-17

Z-42 REV. 4

2 SHEETS SHEET # 2

REPEATER AND INDICATOR cases shall be given two (2) finishing coats of the following colors after which one (1) coat of varnish shall be applied.

Block & Interlocking Signal	Red,
Distant Signal	Yellow,
Approach Indicator	Aluminum,
Track & Lock Indicators	Blue,
Check Lock Indicator	Green.

PIPE. — Threaded parts of pipe, rivets and places where galvanizing has been cut at coupling shall be given one (1) coat of formula "F" paint.

SIGNAL BRIDGES will be painted by the Railroad Company.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

PAINTING SPECIFICATIONS

ALBANY, JUNE 10 1916.

W. H. Elliott 4/24/16.

SIGNAL ENGINEER.

THE U. S. & S. CO.
MAILING DEPT.

OCT 13 1917

OCT 12 1917

RECEIVED
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12
1917

Z-43
REV. 6

9-23-19

TYPE: - Interlocking machines shall be of the Style "A" type and of size and arrangement of levers called for on general plan. Reinforced machine legs for 9 way locking bed, shown on Plan Y-17, shall be provided. Where called for by dog chart, extension leg shall be furnished of such length as required to hold the locking plates to be provided.

All parts of machine, including latches, locking, etc. shall be arranged to work freely without lost motion before being placed in service.

LOCKING bed shall be made up of not less than two (2) four (4) space locking plates providing nine (9) spaces for locking. Back locking with the locking bars placed behind the tappets only shall be used. The locking shall be placed on the side of the machine opposite to the pipe connections to the lever. Locking shall be arranged with a reasonable amount of free space into which additional locking may be placed.

DOG CHART shall be submitted to and approved by the Engineer before shop work on locking is commenced. Tracing of dog chart shall be furnished the Railroad Company.

ADJUSTMENT OF LOCKING: - Latches when locked shall be adjusted to have not more than one eighth ($\frac{1}{8}$) inch lift for direct locking between levers and an additional lift of not more than one-sixty-fourth ($\frac{1}{64}$) inch for each special in the combination.

DRILLING OF LEVERS: - Levers shall be drilled for eight and three-quarter ($8\frac{3}{4}$) inch and nine and three quarter ($9\frac{3}{4}$) inch stroke of pipe line and drilled for time release as per Plan X-151.

ROCKER GUIDES and their application shall be as per Plan Y-18.

TAPPET CIRCUIT CONTROLLER CONNECTION: - A steel stud of dimensions and arrangement shown on Drawing X-150 shall be provided in lower end of tappet to which rod for connection of tappet circuit controller shall be attached.

ELECTRIC LOCK ATTACHMENT: - Rocker and quadrant shall be constructed to permit attachment of electric lock connection.

FRAMED PLAN AND MANIPULATION CHART: - A plan of the interlocking drawn to size and scale required by the Engineer and a manipulation chart with letters not less than three eighths ($\frac{3}{8}$) inch high and well spaced shall be furnished for each machine.

Plain oak frames with plate glass front shall be provided for the interlocking plan and the manipulation chart and shall be permanently mounted in tower, in location given by the Engineer, before plant is bulletined for service.

NAME PLATES: - The framed plan and manipulation chart shall have the name of the plant shown in letters of suitable size, the design and arrangement of which shall be satisfactory to the Engineer. The name of the Contractor may only be shown on frame in small letters on brass plate of satisfactory design.

N. Y. C. R. R.

SIGNAL DEPARTMENT

INTERLOCKING MACHINE SPECIFICATIONS.

ALBANY, DEC. 2nd 1912.

W. H. Elliott 12/4/12

SIGNAL ENGINEER.

Z-43
REV. 6

9-23-19

TYPE: - Interlocking machines shall be of the Style "A" type and of size and arrangement of levers called for on general plan. Reinforced machine legs for 9 way locking bed, shown on Plan Y-17, shall be provided. Where called for by dog chart, extension leg shall be furnished of such length as required to hold the locking plates to be provided.

All parts of machine, including latches, locking, etc. shall be arranged to work freely without lost motion before being placed in service.

LOCKING bed shall be made up of not less than two (2) four (4) space locking plates providing nine (9) spaces for locking. Back locking with the locking bars placed behind the tappets only shall be used. The locking shall be placed on the side of the machine opposite to the pipe connections to the lever. Locking shall be arranged with a reasonable amount of free space into which additional locking may be placed.

DOG CHART shall be submitted to and approved by the Engineer before shop work on locking is commenced. Tracing of dog chart shall be furnished the Railroad Company.

ADJUSTMENT OF LOCKING: - Latches when locked shall be adjusted to have not more than one eighth ($\frac{1}{8}$) inch lift for direct locking between levers and an additional lift of not more than one-sixty-fourth ($\frac{1}{64}$) inch for each special in the combination.

DRILLING OF LEVERS: - Levers shall be drilled for eight and three-quarter ($8\frac{3}{4}$) inch and nine and three quarter ($9\frac{3}{4}$) inch stroke of pipe line and drilled for time release as per Plan X-151.

ROCKER GUIDES and their application shall be as per Plan Y-18.

TAPPET CIRCUIT CONTROLLER CONNECTION: - A steel stud of dimensions and arrangement shown on Drawing X-150 shall be provided in lower end of tappet to which rod for connection of tappet circuit controller shall be attached.

ELECTRIC LOCK ATTACHMENT: - Rocker and quadrant shall be constructed to permit attachment of electric lock connection.

FRAMED PLAN AND MANIPULATION CHART: - A plan of the interlocking drawn to size and scale required by the Engineer and a manipulation chart with letters not less than three eighths ($\frac{3}{8}$) inch high and well spaced shall be furnished for each machine.

Plain oak frames with plate glass front shall be provided for the interlocking plan and the manipulation chart and shall be permanently mounted in tower, in location given by the Engineer, before plant is bulletined for service.

NAME PLATES: - The framed plan and manipulation chart shall have the name of the plant shown in letters of suitable size, the design and arrangement of which shall be satisfactory to the Engineer. The name of the Contractor may only be shown on frame in small letters on brass plate of satisfactory design.

N. Y. C. R. R.

SIGNAL DEPARTMENT

INTERLOCKING MACHINE SPECIFICATIONS.

ALBANY, DEC. 2nd 1912.

W. J. Elliott 12/4/12

SIGNAL ENGINEER.

Z-45
REV. 4
9-22 19

MATERIAL for trunking and capping shall be of first quality, clear, well seasoned cypress, free from knots, checks and other imperfections.

SIZE of trunking shall be as per Plan X-5. Where a larger size is required than shown, the interior depth shall not exceed three (3) inches, unless allowed by the Engineer.

FINISHING:- The trunking shall be dressed on all four (4) sides, the groove in No. 5 trunking being left as finished by machine.

BUILT-UP TRUNKING shall be made with sides nailed to bottom piece. Nails shall not be driven from the inside of groove nor shall they be driven into the groove from the outside of trunking.

INSIDE CORNERS of trunking shall be rounded to a one (1) inch radius.

STAKES shall be of reinforced concrete as per Plan X-143. Rough sawed oak, three (3) inches by four (4) inches and of proper length to permit stake to be buried two (2) feet in the ground, shall be used to support trunking crossing under tracks.

LAG SCREWS shall be of sizes shown on Plan X-5.

FIRE PLATES for protection of wood trunking shall be as per plan X-160. Plates will be furnished by the Railroad Company.

TRUNKING shall be furnished in 12'0", 14'0" or 16'0" lengths.

N.Y.G.R.R.
SIGNAL DEPARTMENT.

TRUNKING SPECIFICATIONS MATERIAL.

ALBANY, JAN. 25th 1913.

Wm. Elliott 1/27/13.
SIGNAL ENGINEER.

Z-46
REV. 2
9-22-19

ARRANGEMENT of trunking shall be as per Plans X-20, X-109, X-119 and X-124.

Where trunking is run parallel with tracks and not in ballast, trunking shall be arranged with one (1) inch clear space under bottom of trunking. Where trunking cannot be placed one (1) inch clear of ground and have top of trunking level with or below bottom of tie, trunking shall be placed with top of trunking one-half ($\frac{1}{2}$) inch below top of rail.

Where trunking is run parallel with and adjacent to mechanical pipe line, it shall be placed at same elevation and on pipe carrier supports unless otherwise allowed by the Engineer.

Trunking laid in ballast shall be laid with bottom of capping even with top of ballast.

But one (1) run of trunking shall be placed between any two (2) ties, and where practicable four (4) ties shall intervene between runs crossing a track.

Trunking shall not be run under a track within three (3) feet of the end of a rail unless specially allowed by the Engineer.

Trunking crossing track shall be without joint for the section coming between ties. Joints in capping must be not less than eighteen (18) inches from joints in trunking.

DRAINAGE HOLE, three eighths ($\frac{3}{8}$) inch in diameter shall be bored through bottom of trunking midway between stakes where bottom of trunking is entirely clear of the ground.

FASTENING OF CAPPING to trunking shall be by means of lag screws with washers placed every three (3) feet on each side of trunking, except for the Nos. 4 and 5 trunkings, for which nails shall be used.

Nails, when used, shall be carefully driven to avoid splitting the wood or to have nail enter groove in trunking.

NUMBER of rubber covered wires that may be placed in each size of trunking:

GROOVE SIZE.	NUMBER AND SIZE OF WIRES.
$1\frac{1}{2}$"x $1\frac{1}{2}$"	5 No.12 and 1 No. 6 or 3 No. 8 and 1 No. 6 B. & S. Gauge.
2"x 2"	12 No.12 and 1 No. 6 or 7 No. 8 and 1 No. 6 B. & S. Gauge.
2"x 4"	26 No.12 and 1 No. 6 or 21 No. 8 and 1 No. 6 B. & S. Gauge.

FIRE PLATES in accordance with plan X-160 shall be provided for protection of wood trunking, containing other than track circuit wires, crossing under tracks.

IRON PIPE when connected to trunking shall have joint made as per Plan X-99, with an inside bushing provided to cover sharp edges of pipe and cap.

RISER BLOCK for protection of rail connecting wires shall be of size and arrangement shown on Drawings X-4 and X-135.

SUPPORTS, when trunking is not placed on pipe line supports, shall be stakes of reinforced concrete or rough sawed oak three (3) by four (4) inches in size set in ground at least two (2) feet and spaced not more than four (4) feet centers.

Where trunking is buried in ballast, stakes shall be placed only at the joints.

No.2 trunking and larger sizes shall have two (2) stakes provided at each point of support.

Joints or turns in trunking shall be supported on pipe carrier foundations or on stakes having a piece of capping eight (8) inches long and the width of trunking placed under trunking ends and securely nailed to same as per Drawing X-117.

Where trunking is of greater width than stake, a piece of capping eight (8) inches long and the width of the trunking shall be placed on top of stake and under trunking.

Where trunking is extended across ditch or other depression necessitating span of greater length between stakes than two (2) feet, trunking shall be supported by a piece of rough yellow pine or oak plank four (4) by six (6) inches in size laid horizontally with suitable supports provided under ends of reinforcing piece.

WORKMANSHIP shall be first class throughout. Trunking shall be placed without irregularities of alignment and with joints neatly made.

N.Y.C.R.R.
SIGNAL DEPARTMENT.

TRUNKING SPECIFICATIONS FIELD WORK.

ALBANY, JAN. 25TH 1913

W.H. Elliott
SIGNAL ENGINEER.

ANCHOR POSTS shall be as per Plan 3900.

ANCHOR POST EXTENSIONS, where used, shall be "Rapp Foundation Extensions".

BOLT LOCKS shall be as per Plans 1900, 1910 and 1920.

COMPENSATORS shall be as per Plans 1400 and 1410.

COTTER PINS shall be as per Plan 0600.

CRANKS shall be as per Plans 900, 1500 and 1510.
Box cranks when allowed shall have solid frame.
Vertical cranks shall be as per Plans 600 and 610.

SOLID JAWS shall be as per Plans 1000, 1100, 1200 and 5920.

SCREW JAWS shall be forged steel as per Plans 1100 and 1200.

PINS shall be finished and as per Plan 1800.

PIPE CARRIERS shall be as per Plan U-38. Strap pipe carriers shall be as per Plan 2300.
Transverse pipe carriers shall be as per Plan 300.

PIPE GUIDES for up and down rods shall be as per Plan U-104.

ROCKING SHAFTS shall be as per Plans 1700, 1710 and 1720 with eleven and three quarter ($11\frac{3}{4}$) inch arms. An intermediate bearing shall be provided for all shafts over six (6) feet in length.

EMERGENCY EQUIPMENT.- Emergency interlocking switch fittings, of type in service, mounted on Equipment Board Plan U-103 shall be furnished for each interlocking.

PIPE CARRIER TOPS AND FOUNDATIONS shall be as per Plan V-7.

PIPE shall be as per Plan 500.

PIPE LINE INSULATION shall be as per Plan 1600.

TANG ENDS shall be as per Plans 1000, 1100 and 1200.

UP AND DOWN RODS shall be of one (1) inch pipe with upper jaw offset one (1) inch and with pipe guide Plan U-104 provided midway of rod.
Connections shall have eight and three quarter ($8\frac{3}{4}$) inch stroke.

Z-48 REV.

N.Y.C.R.R.
SIGNAL DEPARTMENT
MECHANICAL CONNECTIONS SPECIFICATIONS
MATERIAL.
ALBANY, FEB 19th 1913.

W.H. Elliott 2/20/13.
SIGNAL ENGINEER.

Z-49
Rev. 5

5-28-18

ADJUSTMENT.- Screw jaws shall be provided for adjusting pipe connections, but an adjustable switch connection shall be used for the connection to a switch. Screw jaws shall be used for the two (2) connections at crank arms of a compensator or a crank used as a compensator. Each pipe section shall be provided with one (1) screw jaw placed at the end farthest away from lever where not placed at compensator or compensating crank.

INSULATION.- A pipe line insulation as per Plan 1600 shall be installed in each connection to a switch or facing point lock as per Plan 2163.

BOXING as per Plans U-54 or U-66 shall be provided for pipe lines through highway crossings and station platforms.

Leadout opening in signal station shall be closed by seven eighth ($\frac{7}{8}$) inch matched yellow pine boards dressed on all sides and arranged to be removable. Boards shall be neatly fitted to journal 1722 to be provided for each shaft to close opening as per Plan Z-66.

COMPENSATION shall be as per Plan Z-47. Compensators shall be located with reference to pipe line per Plan V-11.

CRANK ARRANGEMENT.- No two (2) cranks are to be placed in the same crank stand where the connection from one crank is made to a switch and from the other to the lock on the same switch. The cranks at switch for switch and facing point lock must have two (2) holes drilled in arms one and one quarter ($1\frac{1}{4}$) inch centers to allow stroke to be increased if desired. Cranks shall be located with reference to pipe line as per Plan V-13.

Cranks shall have eleven and three quarter ($11\frac{3}{4}$) inch or longer arms.

Box cranks shall not be used unless approved by the Engineer.

Cranks or radial arm cranks shall be provided for turns in connections. Cranks at switches shall go on ties where practicable. Where separate foundation is used, it shall be fastened to tie if switch is located in adjacent track.

FOUNDATIONS.- Crank, compensator and pipe carrier foundations shall be as per Plan Z-40.

A concrete foundation of same width and depth as crank foundation and of required length, having a four (4) by twelve (12) inch oak plank bolted to anchor posts embedded in the concrete to give $1\frac{1}{2}$ inch clear space between bottom of plank and top of foundation may be provided on which to fasten a number of cranks that have to be grouped together.

LEADOUT.- Rocking shaft leadout shall be provided.

Outer row of stands for rocking shafts shall be supported on a concrete foundation of same width and depth as crank foundation and two (2) feet longer than necessary to hold required number of stands. Stands may be bolted to anchor posts embeded in the concrete or arranged on oak plank as provided for cranks.

Each row of rocking shaft stands shall be fastened together with a bar or angle iron strap bolted to each stand to prevent springing of the top of stand, as per Plan Z-66.

PIPE CARRIERS shall be spaced not more than seven (7) feet apart. Transverse pipe carriers shall be used to support pipes crossing a track.

PIPE LINES.- Connections for mechanically operated units shall be of pipe as per Specification and Plan 500.

Pipe lines shall be run as shown on General Plan and placed four (4) feet three (3) inches from nearest rail unless otherwise allowed by the Engineer.

Not more than four (4) pipes shall cross the track at one place and at least two (2) ties must intervene between crossings, unless otherwise allowed by the Engineer..

Bends shall not be more than two and three quarter ($2\frac{3}{4}$) inches between supports, unless otherwise allowed by the Engineer, and shall be put in jaws, cranks or one and one quarter ($1\frac{1}{4}$) inch iron rod introduced in the connection for the purpose.

Couplings in pipe line shall be located not less than twelve (12) inches from pipe carrier, with lever on the center of stroke.

N. Y. C. R. R.

SIGNAL DEPARTMENT

MECHANICAL CONNECTIONS SPECIFICATIONS FIELD WORK.

ALBANY, FEB. 19TH - 1913

W. J. Elliott 4/20/13

SIGNAL ENGINEER.

Z-52
REV. 7

WIRES AND CABLES shall be as per R.S.A. specifications.

CABLE wires shall be flexible.

SIZE of wire used shall in each case be ample to carry the current without excessive drop in voltage, and shall not be smaller than called for by Specification Z-39 and general circuit plans. For operation of units with 110 volts, wire shall be of size as per Plan Z-73.

LINE wires shall be double-braided, weather-proof, galvanized B.B. No. 10 B.W.G. wire as per R.S.A. specification, except as may be otherwise specified.

COMMON wires shall be No. 8 B.& S. gauge copper wire. If placed on poles, wires shall be hard drawn and provided with double-braided, weatherproof insulation. If placed in trunking or cable, wire shall be rubber insulated.

POWER line wires shall be No. 6 B.& S. double braided, weather-proof, hard-drawn copper wire. Connections between line, charging switches and batteries shall be No. 6 B.& S. soft-drawn, rubber covered wire.

RUBBER COVERED wires, excepting those strung on poles, shall be soft drawn copper and provided with rubber insulation of thickness specified in the following table;

B. & S.	INSULATION WALL
6	3/32 inch
8	3/32 inch
10	5/64 inch
12	5/64 inch

No. 12 B.& S. gauge rubber insulated wire is the smallest size that may be used.

CROSSARMS shall be of fir as per Plan X-71. Braces and crossarm fastenings shall be as per standard Western Union dimensions. Plan X-112. Galvanized steel pins shall be as per R.S.A. Plan 1166 for dead end wires and as per R.S.A. Plan 1165 for through wires.

INSULATORS for line wires shall be of glass, of the deep groove, double petticoat type.

LIGHTNING ARRESTERS shall be as per Plan X 36.

GROUND PLATES shall be as per R.S.A. Plan 1424, order No. 14244, and R.S.A. Specification for made ground apparatus for lightning arresters.

COPPER LINE WIRE where specified shall be No. 10 B.& S. gauge as per R.S.A. specification for hard drawn weather-proof, D.B. copper line wire.

WIRE CONNECTORS shall be as per RSA Plan 1056, assembly 10563, except that "Carley Connectors" shall be used.

CONNECTING LINKS as per Plan X-162 shall be used on relays and switch circuit controllers where required to connect circuits in multiple.

BUSSES for terminals, resistances and lightning arresters shall be as per Plan X-162. The length and drilling of lightning arrester busses shall be as required for the particular arrangement of lightning arresters used.

N.Y.C.R.R.

SIGNAL DEPARTMENT

WIRING SPECIFICATIONS, MATERIAL.

ALBANY, MARCH 22nd 1913.

W.H. Elliott
SIGNAL ENGINEER.

TIE WIRES for No. 8 and smaller wires shall be of same size and covering as line wire and arranged as per Plan X-72. Tie wires for No. 6 copper wire shall be No. 8 copper wire with double-braided, weather-proof covering. Tie wires shall be given four and one half ($4\frac{1}{2}$) turns.

CONNECTIONS between pole line and relay post, signal or signal bridge shall be as per Plans X-116 or X-27.

DOUBLE CROSSARMS. When two (2) or more wires end at a crossarm, two (2) crossarms fastened with spacing bolts as per Plan X-112, shall be provided.

LIGHTNING ARRESTERS shall be placed in relay box in manner satisfactory to the Engineer and with connections as per Plan W-66.

GROUND PLATES shall be installed at each location where lightning arresters are required in accord with R.S.A. specification for made ground apparatus for lightning arresters. Location of ground connections shall be approved by the Engineer.

JOINTS shall not be made between pieces of rubber covered wire. In renewals or additions they may be used if specially allowed, in each case, by the Engineer. Where rubber insulation is damaged, the wire shall be replaced with a new piece unless specially allowed, in each case, by the Engineer, when the damaged part of insulation may be removed and the wire protected as specified for soldered wire joints.

LINE joints between branch wire and copper line wire in tension shall be made with a McIntyre sleeve and soldered joint as per Plan X-132. McIntyre sleeves shall be given three and one-half (3 1/2) turns.

Joints between branch wire and iron line wire in tension shall be made with soldered joints as per Plans X-166 and X-132.

Joints between branch wire and end of copper or iron line wire shall be made with soldered joints as per Plans X-123 and X-132.

Joints between rail connections and rubber covered wire shall be made with soldered joints as per Plan X-135. Joints between copper line wires in tension shall be made with a McIntyre sleeve as per Plan X-152.

TINNING.- Connections between iron and copper wires or between two (2) iron wires shall be tinned before joint is made.

SOLDERED joints shall be made by connecting the wires together as per Plans X-76, X-105, X-123 and X-166, and by dipping the wires in or

Z-53

by a mixture of alcohol and resin. Other compounds shall not be used. After soldering, the joints shall be wiped clean with a piece of dry and clean cloth or waste.

SOLDERING in a given district shall be done by one (1) man, who shall be efficient, careful, reliable and solely responsible for the quality of the work.

COVERING for all soldered wire joints shall be as per Plans X-76, X-105, X-123 and X-166. The soldered joint shall be thickly coated with Okonite or Goodrich rubber cement or with a solution of pure rubber dissolved in benzine until of the consistency of mucilage, which shall be allowed to dry for not less than one (1) minute. Okonite tape stretched sufficiently to reduce the normal width one half ($\frac{1}{2}$) and overlapping one half ($\frac{1}{2}$) its width shall be wound in successive layers over the joint, as per Plan X-76. The tape shall then be warmed to one hundred twenty degrees Farh. by some dry source of heat, which shall not burn or smoke the insulation. The joint shall then be coated with P.& B. compound applied with a narrow brush, after which two (2) layers of friction tape, overlapping one half ($\frac{1}{2}$) its width and extending one half ($\frac{1}{2}$) inch over braiding on each side of joint shall be applied with a final and thorough coating of P.& B. compound.

COVERING for McIntyre sleeve on pole line shall be of a thick coat of Okonite or Goodrich rubber cement or with a solution of pure rubber dissolved in benzine until of the consistency of mucilage, which shall be allowed to dry for not less than one (1) minute. Two (2) layers of friction tape, with turns overlapping one half ($\frac{1}{2}$) the width of the tape, shall then be wound over the joint and for one half ($\frac{1}{2}$) inch over the braiding on each side. The taping shall then be thoroughly coated with P.& B. compound.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

WIRING SPECIFICATIONS, FIELD WORK.

ALBANY, MARCH 26, 1913.

W. H. Elliott 3/27/13

SIGNAL ENGINEER.

Z-54
REV. 2

9-12-19

WIRES IN SIGNAL STATION shall be placed in trunking or ducts of size sufficient to leave free of wires at least one half (½) of the inside space of such trunking. Trunking and wires shall be run in location required by the Engineer.

WIRES IN TRUNKING OR DUCTS shall be rubber insulated and laid loose and without stretching. The inside corners of trunking at turns, also capping where same is on inside of turn, shall be rounded and all possible slack wire allowed.

Wires when run in trunking, ducts or chases shall be so arranged as to afford an unobstructed way for mice or rats. Wood dowels shall be used if necessary at corners and branch leads in trunking to secure space required.

Special precautions must be taken when installing rubber covered wire to see that the wire is straight and has not been kinked or given a short bend. Where rubber insulation is damaged, the wire shall be replaced with a new piece unless specially allowed, in each case, by the Engineer, when the damaged part of insulation may be removed and the wire protected as specified for soldered wire joints.

WIRES IN IRON POLES.- Wires for mechanisms at top of the pole shall be placed inside of the pole and shall be rubber insulated

WIRES IN PIPE.- Where wires are placed in pipe, suitable bushing shall be provided at ends to protect the wires from coming in contact with the sharp edges of the pipe. The number of wires in different sizes of pipe shall not be in excess of the following:

1	inch	pipe	3	No. 12	wires
1¼	"	"	5	"	"
1½	"	"	8	"	"
1¾	"	"	11	"	"
2	"	"	15	"	"

WIRES IN CONCRETE BATTERY BOXES shall be arranged on porcelain insulators fastened to terminal board. The arrangement of insulators and wires shall be approved by the Engineer.

WIRES IN CHARGING SWITCH BOXES shall be arranged as required by the Engineer, with charging switches and resistance units spaced to give ample clearance for operation.

POLE CONNECTIONS.- Connections between branch and line wires shall be as per Plan X-27 and X-116. Connections between cable and line wires shall be as per Plan X-89.

TAGGING.- All wires shall be tagged at ends and at cross leads in main trunking. Tags shall be as per Plan X-73 and attached to wire with No. 12 lock stitch beeswaxed twine which can be procured from the Western Electric Company. Knots in twine shall be dipped in shellac. Tags shall be plainly stamped to show wire number and destination. On relay wires the letter designating binding post to which wire is attached must precede wire number. Letters and figures to be one-eighth (⅛) inch high.

CONNECTIONS.- Not more than two (2) wires shall be connected to one (1) binding post or wire terminal.

WIRING FOR SIGNAL LIGHTING.- Exterior wires for electric lighting shall be placed in trunking, with signal wires, to base of signal. The wires for dwarf signals shall be carried from trunking at base of signal, to lamp, in armored flexible conduit and for high signals the wires shall be carried inside of pole from trunking at base of signal to the lamp with street elbow and bushings at outlets. The exact arrangement of flexible conduit and pipe bushing outlets to be approved by the Engineer, as required for the type of mechanism installed.

SIZE OF WIRE.- Wire used for electric lighting, except for pendant light connection, shall be of size specified on general lighting plan.

N. Y. C. R. R.

SIGNAL DEPARTMENT

WIRE PROTECTION, FIELD WORK.

ALBANY, JAN. 5th 1915.

W. H. Elliott Mis/ks.

SIGNAL ENGINEER

Z-56

SHEET-1
2-7-20

PURPOSE OF SPECIFICATIONS.

The purpose of these specifications is to furnish general information to the bidders of the general conditions under which the work covered by the general and detail specifications is to be performed and the results desired by the Railroad Company. With this knowledge it is expected the bidders will prepare and submit detail plans and supplemental specifications showing what they propose to furnish, which if accepted will be embodied with and form a part of the general specifications and contract.

MATERIAL, LABOR AND TOOLS.

The Contractor shall furnish material, labor and tools necessary to construct all of the work called for by the general and detail specifications and by the plans specifically mentioned in the specifications to be furnished by the Railroad Company.

DRAWINGS.

Drawings referred to in the general and detail specifications form an essential part thereof. The last issue of a drawing or specification previous to the date of the general specification is the issue specified.

CONTRACT.

The work described in the specifications shall be executed and paid for in accordance with the terms of the New York Central standard form of contract of which these specifications form an essential part.

FURNISHED BY RAILROAD COMPANY.

The Railroad Company will furnish the following items, subject however to the inspection and direction of the Contractor, who is to assume full responsibility for the proper performance of the work. The intention of this clause is to bar any claim by the Contractor that the work done by the Railroad Company has not been so constructed as to enable the Contractor to fulfill all the provisions of these specifications and contract.

FURNISHED BY RAILROAD COMPANY. (Cont'd)

A. Necessary grating.
B. Switches, frogs, ties or special timbers in place.
C. Necessary spacing of ties where required for cross leads of trunking or pipe.
D. Placing of insulated joints in track, which joints will be furnished by the Railroad Company.
E. Necessary permits to do work through public streets.
F. Circuit plans.
G. Colored roundel glasses.
H. Permit for wires to be strung on Western Union poles.
I. Padlocks, N-900.
J. Insulated switch rods in place, except rods Nos. 1 & 2.
K. Work train service for distribution of material.
L. Transportation for men, tools and material on N.Y.C.
M. Signal bridges in place.
N. Such other material and work as may be named in the specifications.

N. Y. C. R. R.

SIGNAL DEPARTMENT.

GENERAL PROVISIONS AUTOMATIC SIGNAL SPECIFICATION

ALBANY, FEB. 7TH 1920.

W.H. Elliott 2/7/20

SIGNAL ENGINEER.

FURNISHED BY RAILROAD COMPANY. (Cont'd)

Should it be shown that any material furnished by the Railroad Company is not suitable for use, it will be replaced free of expense to the Contractor.

A list of the material required by the Contractor for the work shall be submitted to the Railroad Company and the Railroad Company will determine what, if any, of such material shall be furnished by it. The limit price named in the contract shall be reduced an amount equal to the market price as one of the material so furnished by the Railroad Company plus the percentage of profit that would have been allowed the Contractor had such material been furnished by him.

The Contractor shall, as far as practicable, when renewing, changing or making additions to existing installations make use of trunking, wiring, batteries, relays and material or apparatus which will be released during the work.

PROCEDURE IN CHANGING SIGNALS.

Where automatic and interlocking signals are in service and where new signals are to be installed the exact procedure to be followed by the Contractor at each location shall be submitted for the approval of the Engineer. Apparatus now in service will be taken out of service or be replaced by other signals to be installed by the Contractor only when allowed in writing by the Engineer, who will arrange proper bulletin notice to be issued by the Operating Department. In making changes of signals which are in service the Contractor shall do this only under the direct supervision of the Engineer who will be in responsible charge thereof, and the work must be so arranged and carried out that the proper and safe working of the signals while in service will not be interfered with and that signals which are to be changed or replaced will be kept out of service as short a time as practicable.

METHOD OF ACCEPTANCE.

The Contractor must complete all of the work described in the detail specifications in a first-class manner according to the highest state of the art, ready for operation prior to the preliminary or provisional acceptance of the Engineer. The signals for a given section may be placed in service when the parts, in the opinion of the Contractor and the Railroad Company, are complete to an extent making it safe and desirable to use same. The Contractor must give two (2) weeks notice of the time when any given section will be ready for service, and the Railroad Company shall be allowed such length of time after said date of notice which the officials of the Operating Department require to place the signals in service, having due regard for the business of the Railroad Company.

When each section has been placed in service the Railroad Company shall have a period of ten (10) days in which to decide if the work is ready for a preliminary or provisional acceptance. The Contractor must furnish sufficient men to work under the supervision and instruction of the Railroad Company as the Railroad Company deem necessary both for night and day maintenance. If satisfactory to the Engineer provisional acceptance will be given at the end of ten (10) days for such parts of the contract work as have been completed and placed in service. Upon the expiration of thirty (30) days after preliminary or provisional acceptance for the completed work has been given by the Railroad Company, if the work described is demonstrated in the opinion of the Engineer to be a first-class signal system, complying with the requirements of these specifications and operating to his satisfaction, the Railroad Company shall pay to the Contractor the final estimate in the manner stated in the contract.

WORKMANSHIP AND DESIGN.

It must be understood that the Contractor will furnish first-class material, do all work in the best manner and conform to New York Central Standards unless otherwise specified or allowed by the Engineer. All devices and parts shall be designed and manufactured to work smoothly and freely without unnecessary friction, be neat in appearance and of ample strength to prevent undue stresses or distortion. If after installation any devices or parts disclose weakness or are unsuitable for the work, such devices or parts upon request of the Engineer shall be replaced by the Contractor without expense to the Railroad Company. The requirements of these specifications may modify Contractor's appliances, but where these specifications do not otherwise specify or preclude the standard practice of the Contractor may be followed, provided that before any devices are furnished which have not been in general use they shall be submitted for approval and testing by the Engineer.

TESTS.

The Contractor shall make such tests as are required by the Engineer to demonstrate to the satisfaction of the Engineer that the apparatus as installed complies in every respect with the requirements of the specifications and contract. The Contractor shall provide for his own use and that of the Railroad Company such instruments and apparatus as may be necessary for making various tests required by the Engineer. The instruments used in these tests are not to become the property of the Railroad Company.

GUARANTEE.

The Contractor shall guarantee that the system will work with safety, reliability and economy of operation to the satisfaction of the Engineer, giving a performance of not less than forty thousand (40,000) signal movements per signal failure, where there are from one thousand five hundred (1,500) to three thousand (3,000) movements per signal per month, the movement of a signal

GUARANTEE. (Cont'd)

arm through forty-five (45) degrees being considered as one (1) movement.

A failure will be considered as occurring when the signal does not properly show the condition of the block to an approaching train, where the apparatus does not properly perform its functions and gives an incorrect indication, or where through negligence, accident or unknown causes the system was found to be in such condition that a wrong signal indication would have been given should a train have arrived at the signal before repairs had been made.

A broken rail or the wrongful work of an employe of other departments of the road when not working under the supervision of the Signal Department will not be considered as a cause of failure, but all failures occurring through accidental or unknown causes, through oversight, negligence or carelessness of any man working under the supervision of the Signal Department shall be included in the figures on which the performance of the system is determined.

Where two or more signals or pieces of apparatus are affected by a single cause, but one (1) failure shall be counted, failures being based on causes and not on the number of signals giving a wrong indication.

Batteries for operation of block signals and for electro-mechanical interlocking circuits shall be arranged in duplicate to permit of the charging of one set while the other is being discharged.

Where, at an interlocking, the normal discharge rate is in excess of 0.75 ampere, four sets of batteries shall be provided, arranged in multiples of two, so that two sets may be discharged in multiple while the other two sets are being charged in series.

REQUIREMENTS AS TO NUMBER OF CELLS, VOLTAGE, RESISTANCE AND LENGTH OF CONTROL WIRES FOR OPERATING LOW VOLTAGE SIGNALS FROM LEAD-TYPE STORAGE BATTERIES.

CELLS IN SERIES	MIN. VOLTAGE AT BATTERY TERMINALS	MIN. VOLTAGE AT SIGNAL	RESISTANCE OHMS	TOTAL LENGTH MOTOR CIRCUIT #6 B.& S. WIRE BATT'Y TO MOTOR AND RETURN	APPROX. LINEAR DISTANCE FROM BATTERY TO SIGNAL
5	9.0	8.1	0.30	750 FT.	350 FT.
6	10.8	8.1	0.90	2250 FT.	1050 FT.
7	12.6	8.1	1.43	3575 FT.	1650 FT.

Motor control circuit extends from positive terminal of battery through motor to negative terminal of battery.

NOTE. - The capacity of cells for operating various functions shall be as follows:

40 A.H. for operating signals on double track,
80 " " " " four tracks,
120 " " interlocking and track circuits.

N.Y.C. & H.R.R.R.
SIGNAL DEPARTMENT.

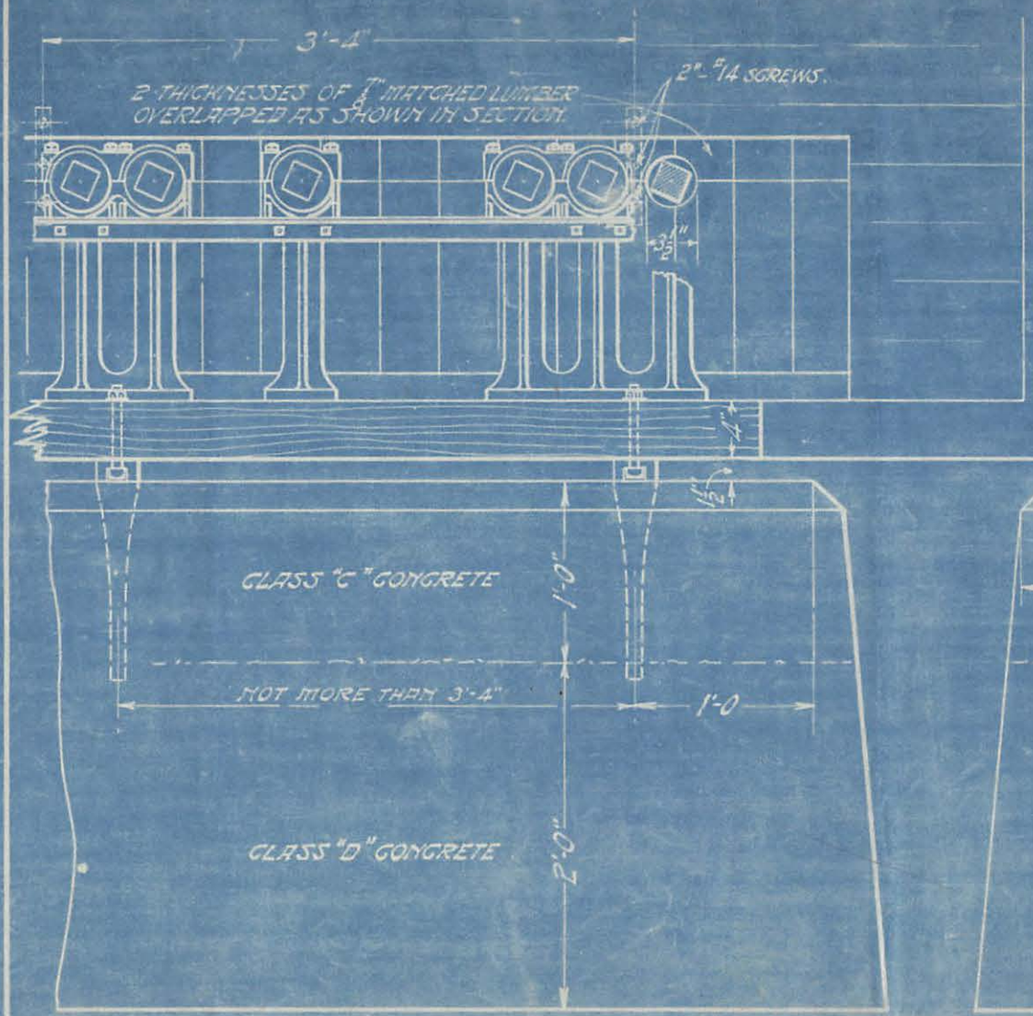
BATTERY CAPACITIES BLOCK SIGNALS AND ELECTRO-MECHANICAL INTERLOCKINGS.

ALBANY, OCTOBER 5TH 1914.

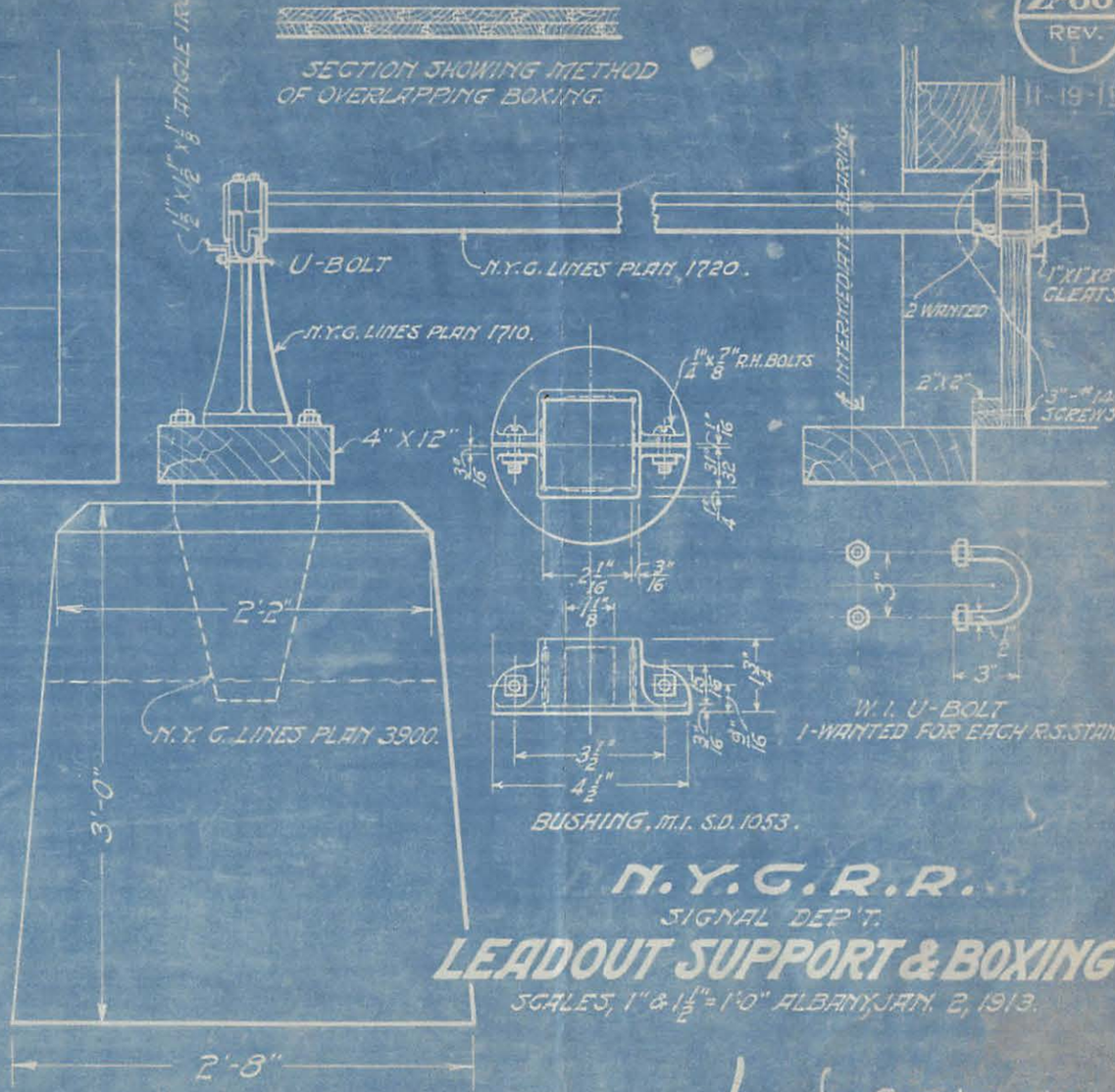
W.H. Elliott. 19/10/14.

Z-66
REV. 1

11-19-13



SECTION SHOWING METHOD OF OVERLAPPING BOXING.



N.Y.G.R.R.

SIGNAL DEP'T.

LEADOUT SUPPORT & BOXING

SCALES, 1" & 1 1/2" = 1'0" ALBANY, JAN. 2, 1913.

W.H. Elliott 1/2/13
SIGNAL ENG'R

NOV 08 1915
THE U. S. & P. CO.
SUNNYVALE, CAL.

NOV 30 '15
SCC

Z-69
REV. 2
3-15-22

SEMAPHORE SIGNALS

OPERATING		LEVER CONTROL					AUTOMATIC
		NON AUTOMATIC		SLOT	SEMI-AUTOMATIC		
		MECH.	POWER				
UPPER QUADRANT	0°-45°						
	0°-90°						
	0°-45°-90°						
LOWER QUADRANT	0°-60°						

LIGHT SIGNALS

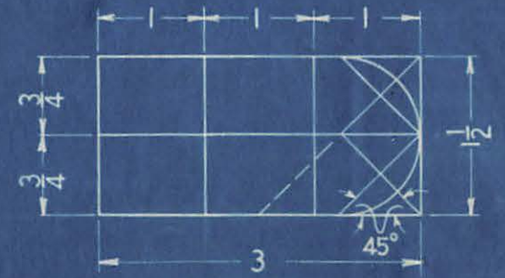
COLOR	LEVER CONTROL		AUTOMATIC	FIXED
	NON AUTOMATIC	SEMI AUTOMATIC		
RED AND YELLOW				
RED AND GREEN				
RED, YELLOW AND GREEN				
RED				

= TO GO IN

= INOPERATIVE

= NOW IN

= TO COME OUT



DIAGRAMS OF CHARACTERISTICS

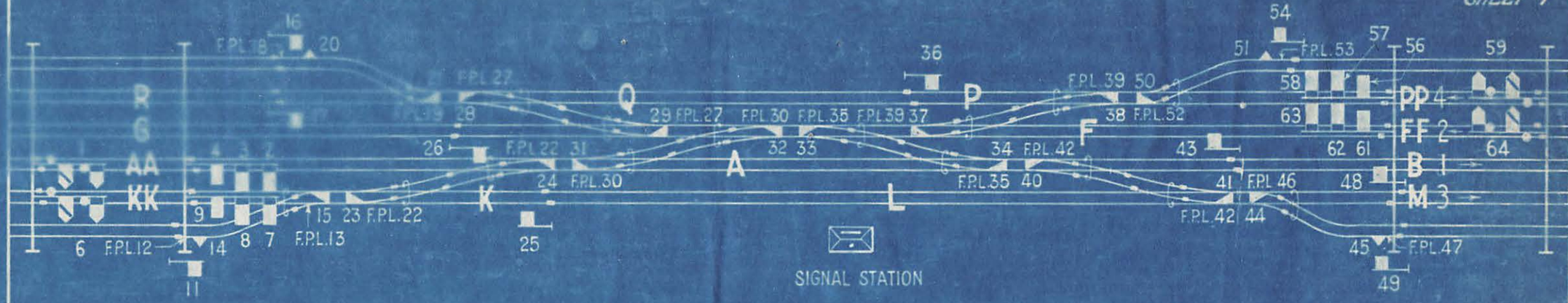
N. Y. C. R. R.
SIGNAL DEPARTMENT
SIGNAL SYMBOLS
JANY. DEC. 31-1913.

SIGNAL

RECEIVED
APR 1 1968

Z-70
REV.
2

SHEET #1



MACHINE.

26 LEVERS FOR 26 SIGNALS
20 " " 16 SWITCHES AND 4 DERAILS
14 " " 20 F.P.LOCKS

60 WORKING LEVERS
4 SPARE SPACES : 5, 10, 55, 60.

64 LEVER FRAME.

NOTE : SHOULD IT BE EVIDENT ANY SIGNAL SHOWN WILL NOT BE REQUIRED IN THE REASONABLY NEAR FUTURE SPARE SPACES FOR SAME MAY BE OMITTED.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

MACHINE NUMBERING,

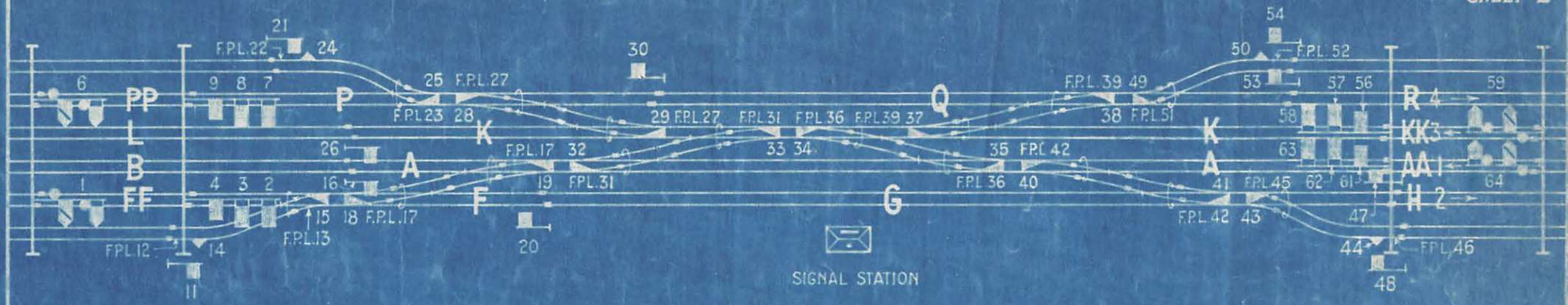
HUDSON DIV.

ALBANY, JAN. 11 1915.

W.H. Elliott, 1/15/15.

SIGNAL ENGINEER.

Z-70
REV.
2
SHEET 2



MACHINE.

26 LEVERS FOR 26 SIGNALS
20 " " 16 SWITCHES AND 4 DERAILS
14 " " 20 F.P.LOCKS.

60 WORKING LEVERS.
4 SPARE SPACES: 5, 10, 55, 60.

64 LEVER FRAME

NOTE.- SHOULD IT BE EVIDENT ANY SIDING SHOWN WILL NOT BE REQUIRED IN THE REASONABLY NEAR FUTURE SPARE SPACES FOR SAME MAY BE OMITTED.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

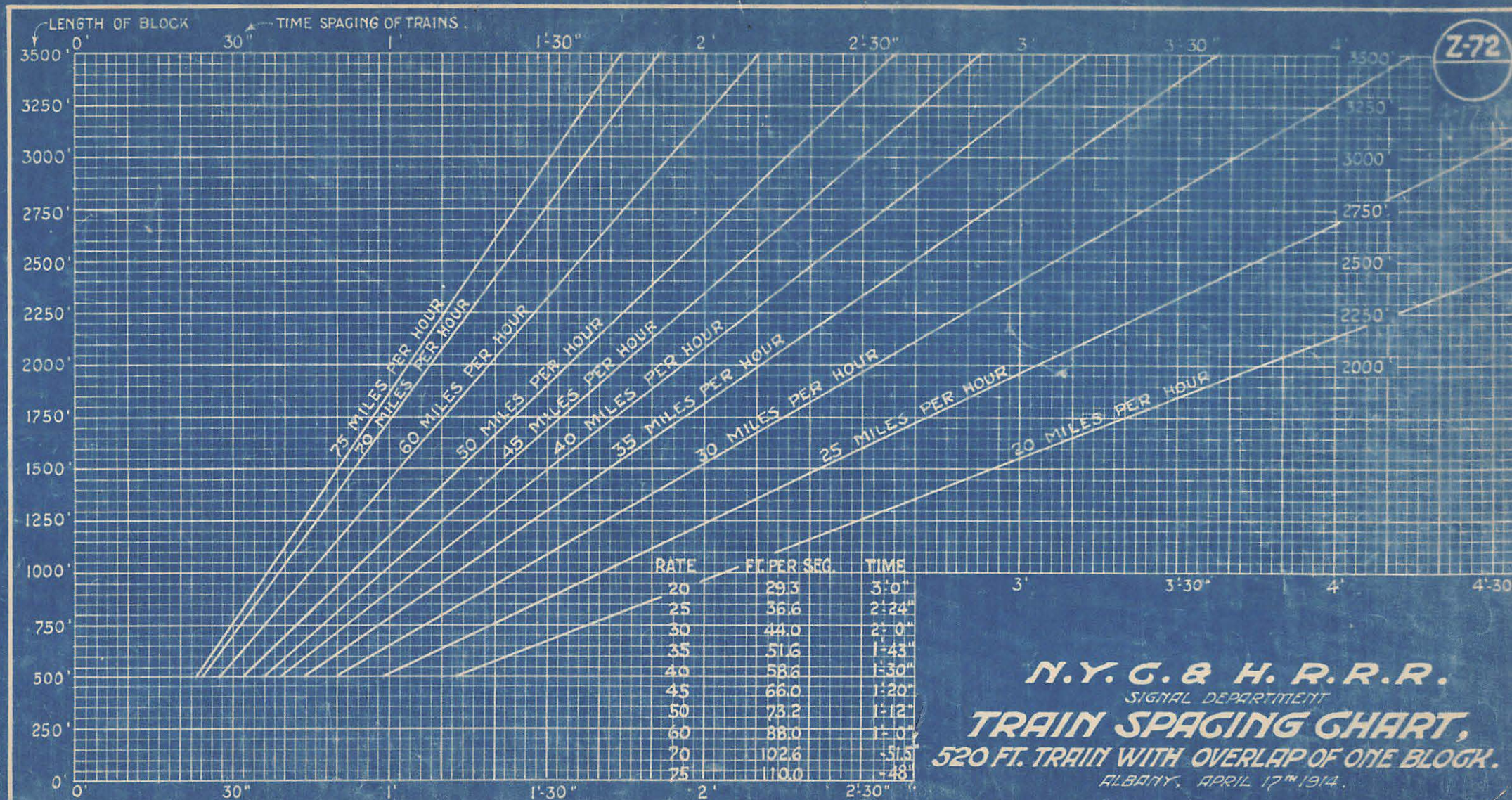
MACHINE NUMBERING,

MOHAWK AND SYRACUSE DIVS.

ALBANY, JAN. 11 1915.

W.H. Elliott. 1/15/15.

SIGNAL ENGINEER.



RATE	FT. PER SEC.	TIME
20	29.3	3'-0"
25	36.6	2'-24"
30	44.0	2'-0"
35	51.6	1'-43"
40	58.6	1'-30"
45	66.0	1'-20"
50	73.2	1'-12"
60	88.0	1'-0"
20	102.6	-51.5"
25	110.0	-48"

Z-72

N.Y.C. & H.R.R.R.

SIGNAL DEPARTMENT

TRAIN SPACING CHART,

520 FT. TRAIN WITH OVERLAP OF ONE BLOCK.

ALBANY, APRIL 17TH 1914.

NOTE: TIME SPAGING OF TRAINS EQUALS TIME REQUIRED TO RUN THREE TIMES LENGTH OF ONE BLOCK PLUS LENGTH OF TRAIN AND THE 4 SECONDS REQUIRED FOR THE CLEARING OF THE HOME AND DISTANT SIGNALS.

W.H. Elliott 4/18/14.

SIGNAL ENGINEER

Z-73
REV. 2
3-14-22

OPERATING AND RETURN WIRES FOR UNITS REQUIRING 110 VOLTS.

UNITS.	NUMBER OF WIRE. B. & S. GAUGE. MAX. LENGTH OF WIRE IN FEET. (See Note).							
	No. 12	No. 10	No. 8	No. 6	No. 4	No. 2	No. 0	No. 00
DWARF SIGNAL	3000'	5000'	5400'					
HIGH SIGNAL	"	"	"					
SINGLE SWITCH	1400'	2200'	3500'	5700'				
DERAIL	"	"	"	"				
ONE END OF DOUBLE SLIP SWITCH		1400'	2200'	3600'				
MOVABLE POINT FROG		"	"	"				
MAIN BATTERY (BATTERY TO BUS)				200'	320'	470'	800'	1140'
BLOCK BATTERY (BATTERY TO BUS)				500'	800'	1200'		

NOTE:- In above table, total length of wire is used extending from positive buss bar on machine through unit back to negative buss.
Separate return wire shall be provided for each unit requiring the use of a switch machine.
Where line wire is used the conductivity of wire shall equal that of soft drawn wire specified in above table.

N.Y.G.R.R.
SIGNAL DEPARTMENT.
WIRE SIZES,
ELECTRIC INTERLOCKING.
ALBANY APRIL 17th 1914.

W.H. Elliott. 4/18/14
SIGNAL ENGINEER.

GENERAL.—Details of trunking and cover shall be as per N.Y.C.Lines plan 3960.

SUPPORTS shall be six (6) inches thick, twelve (12) inches high and not less in width than the trunking to be supported.

Supports shall be spaced not more than four (4) feet centers and shall be placed under main trunking where cross leads occur, and at all joints.

Where trunking is placed on pipe carrier supports, the trunking shall be so arranged that the pipe carrier support will replace the intermediate support of each section. No attachment to pipe carrier supports will be required.

Where irregular spacing of pipe carrier supports leave more than four (4) feet of trunking unsupported, the intermediate support shall be installed.

Where trunking is laid in ballast, support in middle of sections will not be required.

CONCRETE PROPORTIONS.—The concrete for trunking and cover shall be mixed in proportion of one (1) part cement, two (2) parts of fine and two (2) parts coarse aggregates measured separately. The coarse aggregates shall not be larger than will pass through three eighths (3/8) inch mesh. Coarse aggregates shall be broken stone unless otherwise allowed by the Engineer.

CONSISTENCY.— The material shall be wet mixed and of such consistency to cause it to flow into the form and about the metal reinforcement without permitting a separation of the coarse aggregates from the mortar, while the concrete is being conveyed from the place of mixing to the forms.

PLACING OF CONCRETE.—The concrete shall be spaded along each surface of the mould, as it is deposited, to insure the smoothest possible finish. Every section shall be completely filled before any portion of the concrete has set.

Concrete that has partially set shall not be used.

FORMS shall be true to plan and shall be held rigidly in place until the concrete has set.

REINFORCEMENT.—Trunking and cover shall be completely reinforced with two (2) layers of three quarter (3/4) inch steel mesh netting made of No. 14 B.W.G. galvanized steel wire. Mesh shall be of a type having individual wires fastened to each other at crosses.

Z-74 REV. 5 7-3-18

OUTLETS for branch leads shall be provided as required.

WIRE SUPPORT shall be of rough lumber as per N.Y.C.Lines plan 3960.

SECTIONS.—Trunking sections shall be eight (8) feet in length unless otherwise required to suit the local conditions.

A piece of capping two (2) feet in length and without handles shall be arranged between the rails where trunking is run under a track.

Trunking crossing under a track shall not be more than fourteen and one half (14 1/2) inches and the cover not more than fifteen (15) inches in width.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

CONCRETE TRUNKING SPECIFICATION.

ALBANY, JAN. 15-1917

W.H. Elliott. 1/22/17.

SIGNAL ENGINEER.

Z-75
REV. 1
1-17-17

BONDING RAILS.— Where tracks have to be bonded both rails of the track shall be so equipped. Two bond wires shall be used for each joint. Wires shall be placed on the outside of angle bars and bent as per plan X-4. Where joints are located in platform or road crossing, whether of planking, brick or ballast filling, three bond wires shall be used at each joint and placed behind the angle bars. Two of the three bond wires shall be placed on the outside of rail and one on the inside of rail. All bond wires shall be of No.6 B.& S. gauge copper weld wire annealed. Frogs shall be bonded to adjoining rails to make the frogs part of the circuit. No soldered joints will be allowed in bond wires.

RAIL CONNECTIONS.— Wire connections to rails shall be arranged as per plans X-4 and X-135, using one P & M bond wire protector on each rail joint.

WIRING SWITCHES.— Wiring for crossovers and switches shall be as per plan W-16. Wiring for double slip switches shall be as per plan W-20.

SHUNT WIRES shall be of No.6 soft drawn insulated copper wire and shall be bonded directly into the rail. Shunt wires shall be in duplicate and installed in No.5 wood trunking laid in ballast and between ties.

PLUGGING.— Holes in the rail shall be plugged the same day as drilled. Holes shall not be drilled when it is raining as it is essential that inside of holes be kept dry.

CHANNEL PINS shall be heavily coppered, of R.S.A. design and specifications.

N.Y. C.R.R.
SIGNAL DEPARTMENT

BONDING SPECIFICATION

ALBANY, N.Y. JAN. 17, 1917

W.H. Elliott 1/26/17
SIGNAL ENGINEER

RECEIVED
FEB 1 1917

Z-76

SHEET-1

ARRANGEMENT. — Switch operating and locking mechanisms shall be installed to conform with arrangement shown on general plan and without the use of detector bars.

SWITCH CONNECTIONS for mechanical interlocking shall be as per plan 2163. For electric interlocking, switch connections shall be as per plan 2163 with lock and throw rods arranged to suit the particular type of switch operating mechanism used.

DERAIL CONNECTIONS for mechanical interlocking shall be as per plan U-34 for split point derails, and plan U-79 for Hayes derails. For electric interlocking, connections shall be as per plans U-34 and U-79 with lock and throw rods arranged to suit the particular type of switch operating mechanism used.

DOUBLE SLIP CONNECTIONS shall be as per plan 3016 with lock and throw rods arranged to suit the particular type of mechanism used.

SWITCH OPERATING MECHANISM for electric interlocking shall be as per specifications Z-78.

PLUNGER LOCK shall be as per plan 6160, with plunger lock plate and fittings as per plan 5920.

LOCK RODS for switches shall be as per plan 5910, with adjustable lock plate as per plan 6010. Lock rods for split point and Hayes derails shall be as per plan U-82.

RISER PLATES shall be as per plan U-91.

RAIL BRACES shall be of cast iron as per plan 2900. They shall be fitted to a true bearing for entire surface of rail and rail brace plate. Edge of rail brace plate shall be planed to a true surface on the edge placed against rail braces. Height of rail at each switch shall be given by the Engineer and the height of rail brace shall be arranged to suit.

SWITCH RODS AND LUGS shall be as per plans U-83 and U-84. Rods and lugs for double slip switches shall be as per plans U-95, U-96, U-102 and U-106. Lugs shall be made by the Ramapo Iron Works. Nos. 1 and 2 rods shall be furnished by the contractor unless otherwise specified.

TIE PLATES for single switches and split point derails shall be as per plan U-105. For double slip switches and movable point frogs, tie plates shall be of 3/4"x 6" section of length required as per plan 3016 and of composition specified on plan U-105.

BUTT STRAPS shall be as per plan U-105.

TIE STRAPS shall be as per plan 5920 and arranged as per plans 2163 and 3016.

DEFLECTING RAIL shall be furnished and installed by the Railroad Company for each derail as per plan U-108.

N. Y. C. R. R.

SIGNAL DEPARTMENT

SWITCH OPERATING & LOCKING SPECIFICATIONS

ALBANY, OCT. 13TH 1916

W. H. Elliott 10/13/16

SIGNAL ENGINEER.

Z-76

SHEET-2

10-13-16

DETECTOR BARS shall not be required unless otherwise specified.

TIES shall be furnished and installed by the Railroad Company. The Contractor shall frame head tie for mechanically operated switches as per plan U-4. For power operated switches, ties shall be framed by the Contractor as required by the particular type of mechanism used. Contractor shall supervise the placing of switch ties.

ADJUSTMENTS.— Facing point lock plunger shall be made to pass through lock rod not less than seven (7) inches and to clear lock rod one (1) inch when withdrawn. The end of the plunger shall be squared. Connections to plunger shall be made with an adjustable jaw as per plan 2163.

THROW OF SWITCHES shall be five (5) inches. For movable point frogs, double slip switches and derails, throw shall be four (4) inches. Drilling of lock rods shall be arranged accordingly.

POINT DRILLING.— All drilling and rearrangement of switch points and rods in order to provide required spacing as per plan 2163 shall be done by the Contractor unless otherwise specified.
Spike holes shall be drilled in tie plates on two (2) ties to allow points to be spiked in the normal or reversed position.

SWITCH CIRCUIT CONTROLLER CONNECTIONS.— Point lug 122318 as per R.S.A. plan 1223 shall be furnished and installed by the Contractor on the normally closed point of each interlocked switch, derail or movable point frog.

OPERATION.— Switches and facing point locks shall have all connections oiled and in good working condition before plant is bulletined for service.
Each connection shall have all loose or tight bearings adjusted so that any of the units can be easily operated by one (1) man working the lever.
The Contractor shall adjust length of switch rods and height of riser plates so that switch will properly and easily fit in both normal and reversed positions.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

SWITCH OPERATING & LOCKING SPECIFICATIONS

ALBANY, OCT. 13TH 1916.

W.H. Elliott 10/13/16

SIGNAL ENGINEER.

Z-77

10-22-16

DESIGN.- Electric locks for mechanical interlocking levers shall be of the solenoid type as per plan X-144 with details as per plan X-153.

Electric locks for electric interlocking levers shall be of the solenoid type, of design approved by the Engineer.

LOCKS "WHERE REQUIRED".- Locks shall be furnished and installed on all levers controlling top and second arms of home signals, power operated train order signals and check locks, on all F.P.L. levers and levers of mechanical interlocking machines controlling power operated dwarf and calling on signals and on levers of electric interlocking machines controlling electric switch movements.

CONTROL of locks for approach and route locking shall be as per general circuit plans.

APPLICATION TO MACHINE.- Lock shall be connected to tappet on a Style "A" machine as per plan X-154, using insulated connecting rod as per plan X-150.

Lock shall be connected to rocker on a S.&F. machine as per plan X-156, using connecting rod as per plan X-158.

Where additional locks are installed on existing Style "A" machine levers with locks on operating floor they may be connected to rocker of lever as per plan X-155 using connecting rod as per plan X-158.

COVER FASTENING.- Covers of electric locks where installed in operating room of signal station shall be fastened with N.Y.C. special padlock H-900, manufactured by the Yale & Towne Mfg. Co. and furnished by the Railroad Company. As a substitute for padlock a rod with padlock on one end may be used for locking several locks as approved by the Engineer. When locks are installed in the lower story of signal station they shall be fastened with N.Y.C. standard screw lock as per plan X-102.

RESISTANCE.- Lock magnets as per plan X-153 shall be wound to a resistance of twenty five (25) ohms.

For electric interlocking, lock magnets shall be wound to resistance approved by the Engineer.

TESTS.- Electric locks shall withstand the high insulation tests prescribed for track relays. A sample lock shall be submitted to the Engineer for testing and approval.

LOCK CIRCUIT CONTROLLER.- A circuit controlling device of a design approved by the Engineer shall be installed for each lock on F.P.L. levers or for each electric switch movement. Locks on signal levers shall be controlled by means of contact on tappet circuit controller as per general circuit plans or as approved by the Engineer.

CLOCK WORK TIME RELEASES shall be furnished and installed as required by general circuit plans.

Releases when applied to levers of mechanical interlocking machine shall be of the Hall Switch & Signal Co. manufacture and shall be applied to Style "A" machines as per plan X-151, and to S.&F. machines as per plan X-157.

Releases when applied to levers of electric interlocking machines shall be of a type approved by the Engineer for each installation. The releases shall be adjustable and so arranged the device shall become operative before circuit to signal is completed. Releases shall be adjusted to keep the lock circuit open for ten (10) seconds.

HAND RELEASES of the type made by the Hall Switch & Signal Co., for the New York Central shall be furnished and installed as required by the general circuit plans. Hand releases shall be placed on suitable brackets to be erected by the Contractor in the operating room of signal station.

LOCK ADJUSTMENT - NORMAL AND REVERSED.- Mechanical locking shall be effective before the electric lock is effective.

Lock plunger shall drop freely into the notch in lock slide when the latch block goes to normal or reversed position.

The lock shall prevent, with ample margin, the latch block from being raised to clear the quadrant. For mechanical interlocking lever three-eighths (3/8) inch lift of latch block is the maximum effective lift allowed.

LOCK ADJUSTMENT - HALF NORMAL AND HALF REVERSED.- Lock plunger shall drop freely into the notch in the lock slide before the operating function of lever is performed. The lock shall prevent, with ample margin, the releasing of mechanical locking involved.

N.Y.C.R.R.

SIGNAL DEPARTMENT.

ELECTRIC LEVER LOCKING

ALBANY, OCT. 22-1916.

W.H. Elliott 10/22/16

SIGNAL ENGINEER

WHERE REQUIRED.— Track circuits shall be arranged as indicated, location of insulating splices, designating letters and numbers on general plans, with relays and batteries arranged as per general circuit plans.

BONDING shall be as per Specification Z-75.

INSULATED JOINTS shall be furnished and installed by the Railroad Company.

SWITCH AND DERAIL INSULATION shall be provided to carry track circuit through switches and derails without cutting out any portion of main rails. Insulation of single switches shall be arranged as per plan 2163 and W-16 and for derails as per plan U-34.

DOUBLE SLIP SWITCH INSULATION shall be provided to carry track circuit through double slips without cutting out any portion of main rails. Insulation of slip switches shall be as per plans W-20 and 3016.

SWITCH RODS of the insulated type only shall be used, with insulation as per plan 6120 arranged for 1" rod.

RELAY LOCATION.— Track relays shall be located in boxes or on relay rack in signal station with connections to rails as per general circuit plans. Where track circuit is less than 1000 feet in length, relay shall be located not more than 250 feet from rail connections. Where track circuit is more than 1000 feet in length, relay shall be located not more than 75 feet from rail connections.

BATTERY LOCATION.— Where storage batteries are used for track circuits they shall be placed in concrete battery boxes or in battery room, with connections to rails arranged as per general circuit plans. Where caustic soda primary batteries are used they shall be placed in concrete battery boxes with wood lining and with connections to rails as per general circuit plans.

TRACK BATTERY.— For the current supply of track circuits where storage batteries are used, two (2) cells of 120 A.H. capacity shall be provided for each track circuit.

Where caustic soda primary batteries are used two (2) cells connected in multiple shall be provided.

MATERIAL.— Lead type storage batteries shall be as per R.S.A. specification with component parts as per R.S.A. plans 1241, 1340, 1224 and 1341. Electrolyte shall be as per R.S.A. specification.

CAUSTIC SODA PRIMARY BATTERIES shall be of the Edison BSCO Type 1000 A.H. capacity.

RESISTANCE UNITS, as per plan X-139, shall be installed in each connection from storage battery to track. They shall be arranged in charging switch boxes or on relay rack as required by the Engineer. Where caustic soda primary batteries are used one (1) Everett multiple resistance unit shall be installed in positive lead from battery to track.

The resistance unit provided in each connection between storage battery and the track circuit rails shall be of one (1) ohm resistance. These resistances shall not at any time, in emergencies or otherwise, be reduced to less than forty-five hundredths (0.45) ohm total resistance.

The resistance in the connection to a caustic soda primary battery shall not be less than two tenths (0.2) ohm.

RESISTANCE of track relays and length of track circuits shall be as per plan W-89.

Z-8 REV.

SHEET 9 27

N.Y.C.R.R.

SIGNAL DEPARTMENT

TRACK CIRCUIT SPECIFICATION

ALBANY, NOV. 17TH 1916.

W.H. Elliott 11/17/16

SIGNAL ENGINEER

WHERE REQUIRED.— Track circuits shall be arranged as indicated, location of insulating splices, designating letters and numbers on general plans, with relays and batteries arranged as per general circuit plans.

BONDING shall be as per Specification Z-75.

INSULATED JOINTS shall be furnished and installed by the Railroad Company.

SWITCH AND DERAIL INSULATION shall be provided to carry track circuit through switches and derails without cutting out any portion of main rails. Insulation of single switches shall be arranged as per plan 2163 and W-16 and for derails as per plan U-34.

DOUBLE SLIP SWITCH INSULATION shall be provided to carry track circuit through double slips without cutting out any portion of main rails. Insulation of slip switches shall be as per plans W-20 and 3016.

SWITCH RODS of the insulated type only shall be used, with insulation as per plan 6120 arranged for 1" rod.

RELAY LOCATION.— Track relays shall be located in boxes or on relay rack in signal station with connections to rails as per general circuit plans. Where track circuit is less than 1000 feet in length, relay shall be located not more than 250 feet from rail connections. Where track circuit is more than 1000 feet in length, relay shall be located not more than 75 feet from rail connections.

BATTERY LOCATION.— Where storage batteries are used for track circuits they shall be placed in concrete battery boxes or in battery room, with connections to rails arranged as per general circuit plans. Where caustic soda primary batteries are used they shall be placed in concrete battery boxes with wood lining and with connections to rails as per general circuit plans.

TRACK BATTERY.— For the current supply of track circuits where storage batteries are used, two (2) cells of 120 A.H. capacity shall be provided for each track circuit.

Where caustic soda primary batteries are used two (2) cells connected in multiple shall be provided.

MATERIAL.— Lead type storage batteries shall be as per R.S.A. specification with component parts as per R.S.A. plans 1241, 1340, 1224 and 1341. Electrolyte shall be as per R.S.A. specification.

CAUSTIC SODA PRIMARY BATTERIES shall be of the Edison BSCO Type 1000 A.H. capacity.

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The resistance unit provided in each connection between storage battery and the track circuit rails shall be of one (1) ohm resistance. These resistances shall not at any time, in emergencies or otherwise, be reduced to less than forty-five hundredths (0.45) ohm total resistance.

The resistance in the connection to a caustic soda primary battery shall not be less than two tenths (0.2) ohm.

RESISTANCE of track relays and length of track circuits shall be as per plan W-89.

Z-80
REV. 3

SHEET
9-274

N.Y.C.R.R.
SIGNAL DEPARTMENT

TRACK CIRCUIT SPECIFICATION

ALBANY, NOV. 17th 1916.

W.H. Elliott 11/18/16
SIGNAL ENGINEER.

Z-80
REV. 8

SHEET-2

9-27-18

CONNECTIONS to rails shall be as per general circuit plan. For battery leads No. 10 B.& S. rubber covered wire shall be used. For relay leads No. 8 B.& S. rubber covered wire shall be used.

LIGHTNING PROTECTION.— Both leads for each track circuit relay shall be connected to standard lightning arrester with connections arranged as per plan W-66.

CHARGING SWITCH BOXES shall be as per plan X-87.

RELAY BOXES shall be as per plan X-92.

CONCRETE BATTERY BOXES shall be as per R.S.A. plan 1343 and R.S.A. specifications.

CONCRETE POSTS as per plan X-138, shall be used for the support of relay and charging switch boxes. Boxes shall be supported on posts as per plan X-167.

LOCATION.— The exact location of relay boxes, charging switch boxes and battery boxes shall be given by the Engineer on the ground.

LOCKS.— Screw locks as per plan X-102, shall be furnished for each relay box, charging switch box and battery box.

N.Y.C.R.R.

SIGNAL DEPARTMENT

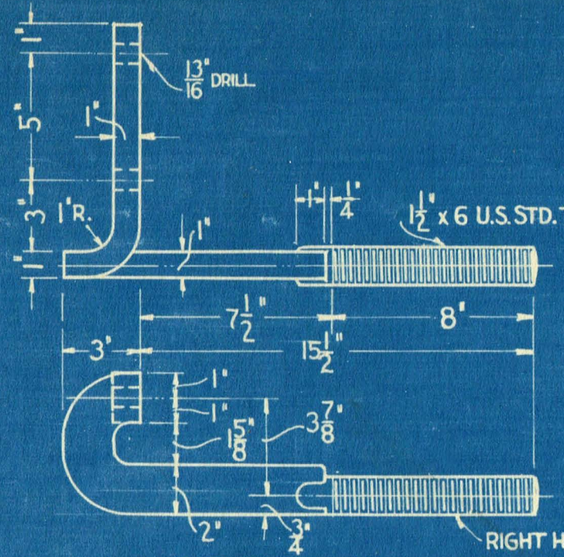
TRACK CIRCUIT SPECIFICATION

ALBANY, NOV. 17TH 1916.

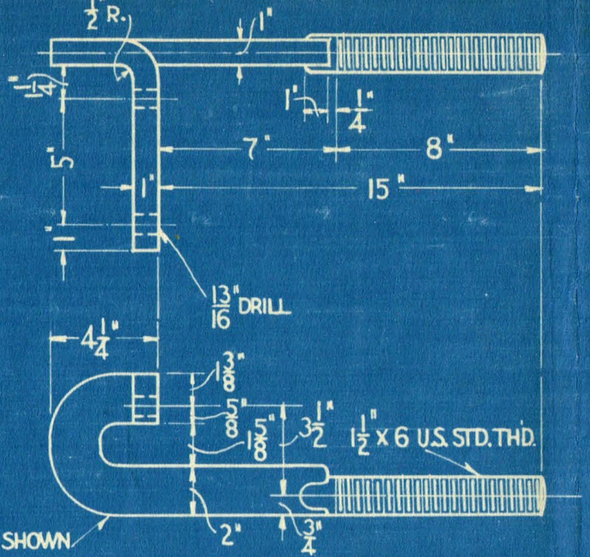
Elliott 1/18/16

SIGNAL ENGINEER

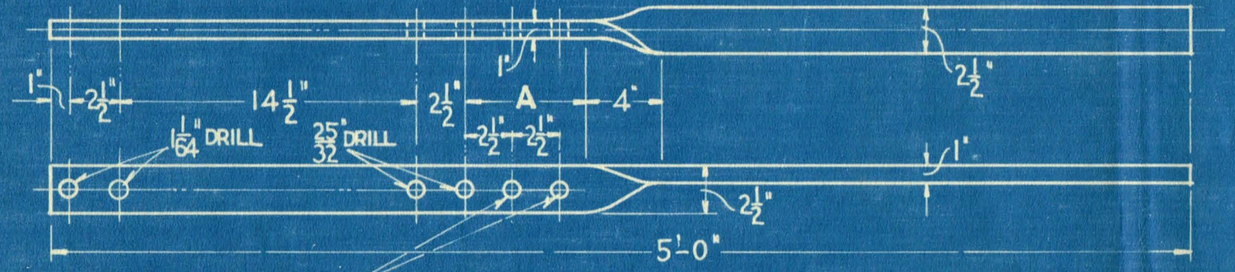
4359
7-11-23



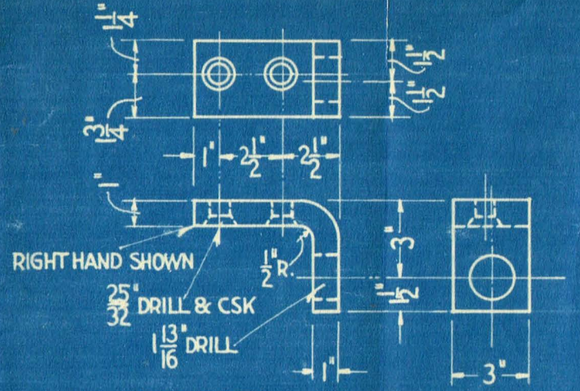
LUG, FRONT ROD, O.H. STEEL.
4359 A RIGHT HAND FOR 100 OR 105 LB. RAIL.
4359 B LEFT HAND " " " "



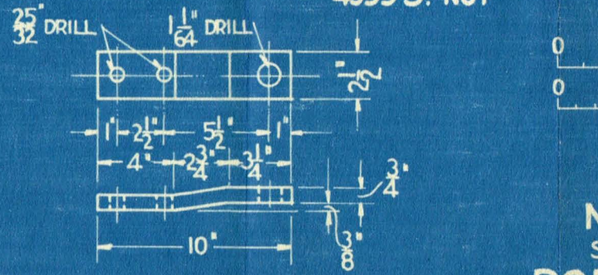
LUG, NO. 1 ROD, O.H. STEEL.
4359 C RIGHT HAND FOR 100 OR 105 LB. RAIL.
4359 D LEFT HAND " " " "



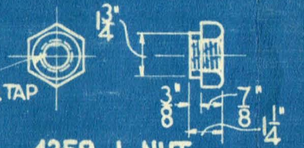
4359 E FRONT ROD, O.H. STEEL. A = 6 1/2"
4359 F NO. 1 ROD " A = 1"



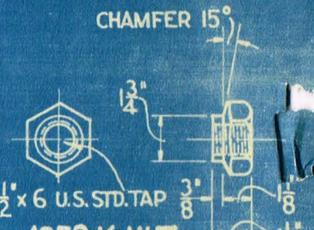
BRACKET. O.H. STEEL.
4359 G RIGHT HAND
4359 H LEFT HAND



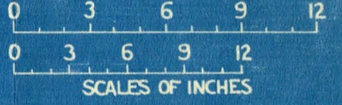
4359 L DAB, O.H. STEEL.



4359 J. NUT



4359 K NUT



N.Y.C.R.R.
SIGNAL DEPARTMENT
RODS AND LUGS
DOUBLE SLIP
ALBANY, JULY 11-1923.